SUBSCRIPTION, ONE DOLLAR PER YEAR FOREIGN, SIX SHILLINGS

AMERICAN

JOURNAL OF SURGERY

A Magazine of Practical Surgery in All its Branches

WALTER M. BRICKNER, M. D. Editor-in-Chief
JAMES P. WARBASSE, M. D. Special Editor
JOS. MacDONALD, Jr., M. D. Managing Editor

PUBLISHED MONTHLY BY SURGERY PUBLISHING CO., 92 WILLIAM STREET, NEW YORK, U. S. A.
J. MacDonald, Jr., M.D., President.

Entered at New York as second-class matter.
Copyright, 1914, by Surg. Pub. Co.
VOL. XXVIII. SEPTEMBER, 1914. No. 9.

CONTENTS

ORIGINAL ARTICLES.

Ionization Treatment of Cancer; End-Results of Twenty Years' Work; A Summary of 300 Cases. G. Betton Massey, Philadelphia, Pa. ..329
The Author's Accidental Discovery—Improvements in Technic—Recent Method of Treatment—Statistical Report—Summary of Cases—Conclusions.

Suprapubic Cesarian Section For Puerperal Eclampsia. B. M. Ricketts, Cincinnati, O. 334
Etiology—Climatic Influences—Health Officer's Report—Celiohysterectomy — Indications—Surgery — Extraperitoneal Cesarian Section—Indications for Celiohysterectomy —Bibliography. (To be continued.)

The Transfixion Treatment of Femur Fractures. John J. Moorhead, New York City. 340
Indications for Femur Transfixion—Time of Application — Method of Application—Technic — Objections — Advantages—Report of Six Cases.

Local Anesthesia as Employed in the Bier Clinic in Berlin. Ralph E. Kleckner, Mattoon, Ill. 343
Two Divisions of Local Anesthesia—Operations Where They can be Employed—Infiltration Anesthesia — Technic — Solution — Venous Anesthesia — Technic — Plexus Anesthesia—Method of Application.

Straight Direct Laryngoscopy, Bronchoscopy and Esophagoscopy. Richard Hall Johnston, Baltimore, Md. (continued from the August issue) 347
Diseases Amenable to Treatment by Tracheo-Bronchoscopy — Ulcer of the Trachea—Tumors—Stenosis of the Trachea and Bronchi—Syphilis of the Trachea—The Diagnosis of the Cause of Obscure Dyspnea—Foreign Bodies in Trachea and Bronchi. (To be continued.)

Military Surgery. Gustavus M. Blech, Chicago, Ill. (continued from the June number) 353
The Patient at the Field Hospital—The Difficulties There — Peritonitis — Sub-acute Peritonitis—Treatment—Secondary Hemorrhages—Injuries to the Ureter—Gunshot Wounds of the Bladder.

Acute Myalgia of the Abdominal Muscles. A Condition to be Differentiated from Surgical Lesions. James T. Hanan, Montclair, N. J. 355
Scanty Literature on the Subject—The Frequency of This Condition—Errors in Diagnosis—Report of Cases—The Etiology—Bibliography.

Observations on Lacerated and Contused Wounds. L. Sexton, New Orleans, La. 358
Variety of Wounds—Healing—Hemorrhage —Treatment of Non-operative Wounds—Redressing — Infected Wounds — Their Treatment.

EDITORIALS.

What Will Surgery Learn From the Present War 360

The Medical Reserve Corps of Our Army and Navy 360

The Anesthesia Supplement 361

Surgical Suggestions 361

SURGICAL SOCIOLOGY 362

BOOK REVIEWS.

The Practice of Surgery—Howard. Abdominal Surgery, Clinical Lectures for Students and Physicians—Rovsing. Guiding Principles in Surgical Practice—Neef. 363

Diseases of the Rectum and Colon and Their Surgical Treatment—Lynch. A Treatise on Diseases of the Rectum and Anus—Cooke. The Treatment of Neurasthenia—Playfair. Medical and Surgical Reports of the Episcopal Hospital in Philadelphia. On Dreams—Freud. Diagnostische und Therapeutische Ratschläge für den Gynäkologischen Praktiker—Asch. 364

PROGRESS IN SURGERY. A RÉSUMÉ OF RECENT LITERATURE.

Ovarian Pain. Placenta Previa..364

Chronic Leucorrhea. General Enteroptosis. Uterine Tumors. Retrodisplacements of the Uterus. Pyloric Stenosis. Pyloric Obstruction. 365

Induced Pneumothorax. Compound Fractures. 366

The Value of Hexamethylenamin. Hexamethylenamin. Pyorrhea Alveolaris. Pruritus Ani. Anastomosis Between the Parotid and Submaxillary Glands. 367

Tumors of the Spinal Cord. Malignant Tumors of Bone. Pseudarthrosis. Conduction Anesthesia. Local Anesthesia for Prostatectomy. Heliotherapy in Tuberculous Fistulae. Chronic Intestinal Stasis. 368

MISCELLANY.

Factors in Abdominal Operations.333

Seminal Vesicle Infection.....339

Empyema Thoracis 343

Russian Oil, P. D. & Co.

A VALUABLE INTESTINAL LUBRICANT.

This product is a hydrocarbon oil distilled from Russian petroleum. It is water-white, odorless and tasteless. It is free from sulphur compounds, acids, alkalies, and all harmful by-products.

Russian Oil, P. D. & Co., is notable for its high specific gravity, its resultant high viscosity, its exceptional lubricating power—features in which it is greatly superior to the cheap petrolatums of low specific gravity.

Russian Oil, P. D. & Co., is not a purgative. It is not a laxative in the generally accepted sense of the term. It is an *intestinal lubricant*—a most efficient one.

We supply two preparations of **Russian Oil**—one **Aromatic,** one **Unflavored.**

Pint, ½-pint and gallon bottles.

WRITE FOR DESCRIPTIVE CIRCULAR.

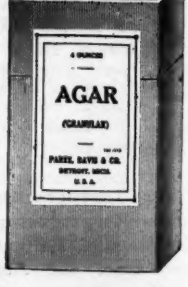
Detroit, Michigan.

Parke, Davis & Co.

Agar (Granular), P. D. & Co.

FOR TREATMENT OF CHRONIC CONSTIPATION.

This is a product of Japan, derived from seaweeds and sometimes known as Japanese gelatin. It is supplied commercially in dry, transparent pieces that are reduced to coarse flakes for medicinal use. It freely absorbs water and retains it. It resists the action of the intestinal bacteria and of the digestive enzymes. Its chief use in medicine is in the treatment of chronic constipation.



Eaten as or with a food, **Agar** passes practically unaltered into the intestine, where it moistens the feces, thus aiding peristalsis.

Agar is not digested. It serves rather as a mechanical stimulant to the bowels, aiding in the production of a normal, healthy evacuation—a condition approximating the natural function.

Pound and ¼-pound packages.

WRITE FOR DESCRIPTIVE CIRCULAR.

Detroit, Michigan.

Parke, Davis & Co.

Please mention the American Journal of Surgery when writing advertisers.

AMERICAN
JOURNAL OF SURGERY

VOL. XXVIII. SEPTEMBER, 1914. No. 9

IONIZATION TREATMENT OF CANCER; END-RESULTS OF TWENTY YEARS' WORK; A SUMMARY OF 300 CASES. *

G. BETTON MASSEY, M.D.,
PHILADELPHIA.

On July 31, 1893, I discovered by accident that a local cancerous growth could be conveniently devitalized by driving into it certain parasiticidal chemicals by a direct electric current. Since that date, now more than twenty years ago, a large portion of my time has been spent in improving the technical details of this process and ascertaining its indications and limitations. Another worker in the same field, Prof. Stephane Leduc, of the School of Medicine of Nantes, France, has done much to clear up the exact nature of the electrochemical reactions involved, and has shown that the essential agent in this method of tissue cell devitalization is the ion of the electrolyzed zinc anodes, the ionic state of the nascent atoms of zinc released by the current permitting them to be driven by it into chemical union with the contents of the cells of the growth, where they lose their ionic state and combine with the cell constituents, producing new compounds that are dead and sterile.

During the years mentioned other physical agencies have been discovered and employed in cancer therapy, notably the Roentgen ray and radium, all of them having had attention at my hands. It has been only in my failures with ionization, nevertheless, that I have turned to other methods, none of the successful results illustrated and tabulated in this paper having received any other treatment than ionization, though many were previously failures under other methods.

The most recent technic adopted in the ionic destruction method is its bipolar application, in which the whole of the growth is directly included between the electrodes of the ionizing current, the electrodes yielding the ions of zinc being inserted at the peripheries. This permits of the use of a more powerful current under which the zinc electrodes are quickly ionized and a large growth turned white, devitalized and sterilized in from twenty to thirty minutes without tetanizing nearby structures, under either local or general anesthesia. This technique has been used whenever possible since 1906 and most of the good results to be reported were obtained under it; though thirty-five of the 129 patients remaining free from the disease were placed under the older, unipolar method from eight to seventeen years ago.

Fig. 1. Scars four years after ionic operation for carcinoma of lower lip and glands of neck.

TABLE A.

Statistics of 300 Cases of Cancer under Ionization Treatment During the Twenty Years between 1893 and 1914.

	No. Cases	Cured	Died	Per cent. Cured
Operable Epitheliomas	66	62	0	...
" Carcinomas	25	23	0	...
" Sarcomas	2	2	0	...
Total Operable Cases	93	87	0	93.5
Inoperable Epitheliomas	24	17	0	...
" Carcinomas	159	18	10	...
" Sarcomas	24	7	1	...
Total Inoperable Cases	207	42	11	20.2

Mortality per cent., all cases, 3.6; of inoperable cases, 5.3.

Table A indicates the results of the ionization treatment of the three hundred patients with malignant growths placed under the method by me between its inception, July 31, 1893, and December 31, 1913. The cases include all so treated in this period of over twenty years, many of them having been received in a condition that would now be regarded as contraindicating the method. These results have been brought down to the present moment in the cases of living patients and to the

*Read before the Philadelphia County Medical Society, March 25, 1914.

time and nature of death of those who are known to have died in this rather long time.

The table shows that 129, or 43 per cent. of all patients treated, have shown no return of the disease, at least 85 of which have passed the three-year period and are living at present without recurrence or metastasis, as shown in Table B. Twenty-four have not yet passed the three-year point since treatment, though still free from recurrence or metastasis, and twenty have died since treatment of some affection unconnected with cancer.

Of the operable cases, a total of 93, 87 were cured, a percentage of 93.5.

Of the 207 that were classed as inoperable in the ordinary surgical sense, 42 were cured, a percentage of but 20.2.

Before treatment — Two years after treatment — With artificial nose attached to spectacles

Fig. 2. Squamous cell epithelioma of nose. One bipolar major ionic operation of 200 to 700 milliamperes for forty minutes.

TABLE B.

Time Since Treatment of the 129 Patients of Table A showing No Disease

1	patient	has	passed	17	years
1	"	"	"	13	"
2	patients	have	"	12	"
1	patient	has	"	11	"
7	patients	have	"	10	"
12	"	"	"	9	"
11	"	"	"	8	"
18	"	"	"	7	"
14	"	"	"	6	"
5	"	"	"	5	"
6	"	"	"	4	"
7	"	"	"	3	"
6	"	"	"	2	"
12	"	"	"	1	year
6	"	"	"	less than 1	year

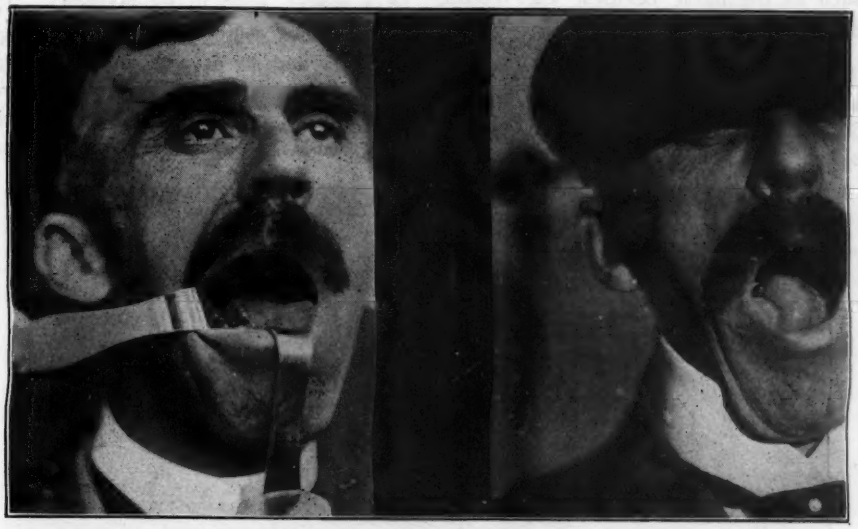
20 patients have died since treatment of other affections, without recurrence.

September 5, 1909 — June 18, 1910

Fig. 3. Epithelioma of nose.

A great majority of the inoperable cases were recurrences after excision operations. The difficulties attending the successful application of this method in recurrent cases are indicated when I state that but 15 of the 129 cures were obtained in patients that had been operated upon previously by the knife. Previous prolonged treatment by the Roentgen ray is also detrimental to a case from the point of view of its operability by ionization, as the radiation conceals the true limits of the growth and is apt to suggest a less extensive destruction than needed.

The mortality of 3.6 per cent. refers to all growths treated. As the operative deaths, mainly from secondary hemorrhage in connection with very serious growths, were confined to the 207 carcinomas and sarcomas, a computation on that basis would show the mortality to be 5.3 per cent.



Before treatment, October 10, 1911 After treatment, December 6, 1911

Fig. 4. Squamous cell epithelioma of tongue.

Wound after separation of slough Scar one and a half years later.

Fig. 5. Carcinomatous nodule the size of a marble in outer quadrant of breast. 1,000 milliamperes for ten minutes, under ether, after removal of a specimen.

In Table C the 300 cases are classified as to location, irrespective of histologic diagnosis, a most

useful grouping for practical study, as one of the chief advantages of the method is its adaptability for the eradication of growths in certain confined localities, such as the nasal cavities, the mouth, rectum and axilla.

TABLE C.
SUMMARY OF 300 CASES BY LOCALITY

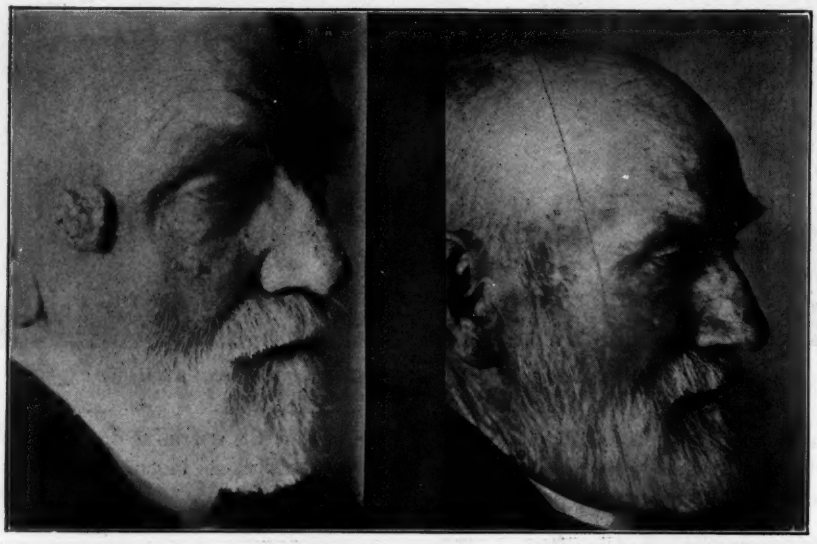
	Cases	*Cured*	*Deaths*
Mammary Gland	67	20	2
Face	62	49	0
Mouth	48	14	4
Cervix Uteri	25	3	1
Rectum	20	9	2
Neck	17	3	1
Lip	9	6	0
Ear	9	1	0
Eyelid	7	7	0
Maxilla	6	1	0
Skin	6	6	0
Orbit	5	0	1
Groin	4	0	0
Nose	4	4	0
Scalp	2	1	0
Hand	2	1	0
Axilla	2	1	0
Shoulder	1	1	0
Abdominal Wall	1	0	0
Penis	1	1	0
Urethra	1	1	0
Larynx	1	0	0
	300	129	11

The diagnoses under which the cases are classified were verified in every instance, copies of the reports of pathologists corroborating the diagnosis having been found with about three-fourths of the case histories, and are in my records for inspection.

CONCLUSIONS.

My observation of the results of the ionic method in these cases, whether of cure, amelioration or failure, convinces me that it is the preferable mode of attempting immediate eradication in the following conditions:

It is an ideal method of immediate eradication of any small, circumscribed growth of the skin or mucous membranes, whether definitely malignant or merely in the suspicious condition called "precancerous" (though, strictly speaking, a cancer must be a cancer, even in its infancy). The unipolar method is exceedingly simple, bloodless, and almost painless, and by it any physician with a simple constant current office outfit may destroy in a few minutes any small, circumscribed epithelioma of the skin, eyelids, nose, mouth, rectum or vagina. The



Before treatment, July 26, 1909 After treatment, September 6, 1911

Fig. 6. Squamous cell epithelioma.

Fig. 7. Scar one year after destruction of tubular carcinoma of breast the size of a golf ball in a patient aged 74. One ionic application of 1,000 milliamperes for fifty minutes under local anesthesia.

93.5 per cent. of cures that have stood the test of years without recurrence is significant.

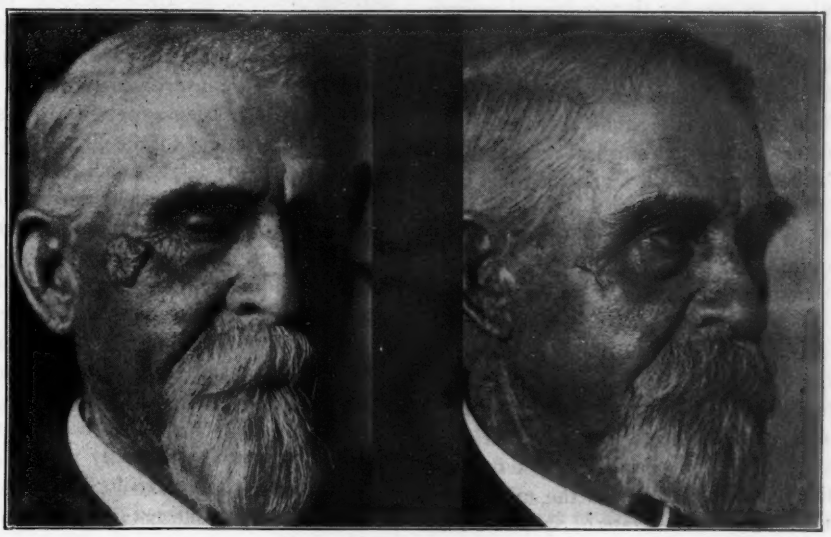
An extension of its value in incipient cases, particularly the bipolar technique, is the possibility of

destroying by this method small carcinomas of an organ such as the tongue and breast without sacrificing the whole organ, in the rare cases in which our attention is called to them in this stage. The absolute sealing of the edges of the wound at the moment of devitalizing the small growth renders this method possibly the only one by which such an eradication may be successfully done without re-infecting the organ. The list contains several cases in both of these organs that have remained free from recurrence from six to nine years.

The second group of cases in which the bipolar method has been found to be particularly valuable is made up of those carcinomas and sarcomas that on admission are just beyond the line of successful removal by the knife. The conditions attending ionic destruction precluding operative re-infection, the destruction may be carried deeper in growths that would necessarily be wounded in an effort at excision. This is particularly true of growths situated within cavities, which may be destroyed through the natural openings without mutilating overlying structures. In the axilla the skillful placing of the electrodes permits us to destroy the whole contents without removing the pectoral muscles.

The deaths recently reported following powerful radium treatment indicate by contrast one of the advantages of the ionic method in growths properly situated for its employment. While powerful application of radium may kill carcinoma *within the body,* with the dead tissue in intimate association with unclosed absorbents, the ionic method automatically removes its products from biologic association with the patient. After an ionic destruction the dead tissue is immediately placed outside the body biologically by the sealing of the absorbents. The patients present no rise of temperature during separation and there is no evidence whatever of absorption of toxins.

The contraindications to the method are mostly of a surgical nature, involving risk of secondary hemorrhage when large vessels lie too close to the growth; when local dissemination is too deep in recurrent cases for all parts to be reached effectively; in carcinomatosis or sarcomatosis of gland chains; in too extensive subsurface implantations, as *cancer en cuirasse,* etc. In these classes of cases the ionic method should not be used, except in some instances to remove the upper layers of a growth in preparation for intensive Roentgen ray application or for thermo-radiotherapy.



August 7, 1911 July 6, 1912

Fig. 8. Epithelioma of face.

1823 WALLACE STREET.

FACTORS IN ABDOMINAL OPERATIONS.

Rough handling of the abdominal viscera and needless dragging or pulling upon the mesentery favor both post-operative tympanites and abdominal pain and discomfort. Gentleness in the separation of adhesions so far as possible along natural lines of cleavage will lessen the number of new adhesions that will form, and reduce the incidence of pulmonary and cerebral emboli.

Complete hemostasis should always be sought Whenever important vessels are ligated, if they cannot be thoroughly isolated, a suture should be introduced which will include enough proximal tissue to prevent slipping.—RAYMOND WALLACE in the *Southern Medical Record.*

SUPRAPUBIC CESAREAN SECTION FOR PUERPERAL ECLAMPSIA.

B. M. RICKETTS, M.D.,
CINCINNATI, OHIO.

While deaths due to accident or disease during the pregnant state are perhaps the most deplorable, those due to eclampsia are more horrible and with a greater mortality, because two lives are concerned.

It is therefore no wonder that opinions concerning ways and means to overcome them should be at such variance. Not until a comparatively recent period in the history of dealing with eclampsia have care-takers had to offer other than therapeutic and dietetic measures, surely not surgical measures, except it be phlebotomy, the value of which has probably been underestimated, delivery per vaginum by various methods not being considered in cases after the sixth month.

The great number of deaths occurring annually due to this fulminant toxemia is sufficient within itself to excite suspicion that additional measures are necessary to overcome its ravages. It must be admitted, however, that those most interested in the subject are sorely at variance. But the squaring of the circle has been voted a possibility by a few who can locate the north star, describe the milky way, and estimate the courses and rate of speed of Halley's comet.

Enough evidence is offered in the accompanying reports and tables to change the existing angular thought to one more graceful and enduring. Though the hand of the juggler may cause the compass to vacillate for the time being, its point will eventually direct the proper course to be followed in caring for the eclamptic.

The destruction of a city of large proportions by quake and fire was necessary to overwhelm and convince the world that there is something other than the roar of cannon and the glistening of swords.

It required the loss of the newest and largest ship ladened with the costliest cargo and the greatest number of human lives to change the laws governing the navigation of the high seas. It was recently necessary for five million people to be overwhelmed by the sudden inundation of their homes, two hundred thousand of which were totally destroyed, to prove the fallacy of human endeavor; and it will ever be thus.

Zinke states (*Journal of the A. M. A.*, July 26, 1913) that he has observed 30 cases of eclampsia resulting as follows: "Four mothers, 13.3 per cent., died; 15, or 50 per cent., of the children were lost." The still high maternal mortality, 13.3 per cent., and fetal mortality, 50 per cent., in his last 30 cases, he says, was due to the fact that two of the mothers were moribund when first seen by him; one remained in profound coma after the first, and another after the eleventh, convulsion. The third died of shock and hemorrhage following an *accouchement forcé* performed by the physician in charge of the case. The fourth died soon after the eleventh convulsion, and a comparatively easy vaginal hysterectomy performed without an anesthetic. It is not claimed that the above mode of procedure will be invariably successful; but Zinke's experience impels him to believe that in those cases in which it fails, very little could have been expected from surgical intervention. Certainly, in the presence of any condition, maternal or fetal, which makes the birth of a child *per viam naturalem* harzardous or impossible, abdominal or vaginal Cesarean section or deep cervical incisions, each depending on the period of gestation and other circumstances, is a justifiable operation. But in view of the evidence presented, it can only prove a serious error to maintain that an immediate interruption of gestation or termination of labor, by any surgical method in vogue, is the treatment *par excellence* in eclampsia. The good results obtained from strictly medical care in these cases far exceed the results accruing from all the surgical means proposed for relief from the disease.

Lutz (*Surg. Gyn. & Obst.*, p. 550, June, 1913) summarizes the following statistics of the Urban Lying-in Hospital from 1909 to 1912: 1 case of eclampsia in 107 deliveries; 24 per cent. of the eclampsia cases occurred during the puerperium; the maternal death rate was 6.7 per cent. as a whole, 9 per cent. during the puerperium and 5.9 per cent. before and during delivery. The fetal mortality was 32.7 per cent.; but, excluding the post-partum cases, this rose to 36 per cent. The customary treatment of inducing labor was followed, rather than making a vaginal Cesarean section.

The labors terminated three times spontaneously, 17 by forceps, 13 by version and extraction, 3 by perforation, and 1 by vaginal Cesarean section. Venesection, morphine, and chloral were freely used. The author advises immediate delivery in severe cases where the pulse is small and rapid, the urine scanty, and coma persists between attacks.

On August 4, 1913, St. Ann's Maternity Hospital, St. Louis, Mo., Dr. Percy H. Swahlen states that they have delivered from 96 to 117 per annum for five years with only three cases of eclampsia during that period, one coming on during labor, one

four hours after labor, and one near the time of expected labor.

ECLAMPSIA STATISTICS.

The great number of deaths occurring annually resulting from eclampsia in the United States should excite enthusiasm in devising ways to overcome its ravages. To show that this may be done the reports from various individuals and health officers of the larger cities have been assembled together with that of the United States Census Bureau.

There being no concerted action on the part of the states and territories to tabulate the deaths due to eclampsia, or any other cause, preclude the possibility of the United States Census Bureau making correct statistical reports. However, an attempt was made in 1908 to get the co-operation of the various health boards of the states to make them correct. It is interesting to know that there are many states that have absolutely refused to co-operate with the Census Bureau, and of the great difficulty it has had in securing the co-operation of those states within the census zone.

The Bureau cannot, therefore, give full detailed reports of diseases and their mortalities, though enough evidence has been secured from the more thickly populated states and cities to determine the approximate mortality of eclampsia, which is four to one hunderd thousand population, or four thousand deaths annually in the United States. To the four thousand deaths of mothers may be added forty thousand deaths of children, making forty-four thousands deaths due to a disease that may be partially, if not completely, amenable to surgical, therapeutic, or hygienic measures, probably the three combined.

The Charity Service of Cook County, Illinois, reports: "We beg to state that during the past year we have had fifteen cases of puerperal eclampsia in this hospital, and of this number, seven have died."

Charity Hospital statistics of New Orleans, from June, 1908, to June, 1913, are as follows:

Parturition eclampsia, total, 33 cases; cured, 13; died, 20; 27 children cured; 6 died.

Pregnancy eclampsia, total, 7 cases; improved, 1; died, 6; 6 children cured; 1 died.

Puerperium eclampsia, total, 4 cases; 1 improved; 1, no record; 2, died; 3 children cured; 1, no record.

Total mothers, 44; 13, cured; 2, improved; 1, no record; 28, died; 36 children cured; 7, died; 1, no record. There was no Cesarean operations for eclampsia.

Munro Keer Glascow Medical Hospital reports for fifteen years a mortality of 47 per cent. in cases of eclampsia, without Cesarean operations.

Herman Trousac (*Medical Society of London*, vol. xxv, p. 224, 1902) reports 38 cases of convulsions not operated on with 20 deaths. The following are the ages most frequently occurring:

Ages 10-19, 263 cases.
Ages 20-29, 981 cases.
Ages 30-39, 700 cases.
Ages 40-49, 146 cases.

ETIOLOGY.

The very interesting history of this disease is ancient and available in the various indexes and too well known now to receive other than passing mention. It probably occurs as early and as constant with animals as with man, though many appear to have escaped, indicating that it may possibly be a condition due to the influences of civilization and domestication. However, man appears to be the only one for whom it has a predilection.

The egg-bearing animals and birds are the only members of the two sub-kingdoms vertebrata that are exempt from conditions simulating eclampsia and, so far as they are known, confined to the mammals.

CLIMATIC INFLUENCES.

The reports at hand from health officers and hospitals of the larger cities indicate that there is a higher per cent. of eclampsia and mortality in the Southern states, and that the per cent. of cases and mortality is greater in the black than in the white race, there being no evidence at hand concerning the red and yellow races.

Statistics pertaining to eclampsia, like those upon any other subject, are more or less imperfect, and will remain so until legal measures are complete to make them perfect, but there is no excuse for lessening our efforts.

The high mortality among the people of the Southern states is probably due to unknown climatic influences; but with the absence of any evidence that the peoples inhabiting the arctic regions have a lower mortality than those of the middle and temperate zones, this question must remain indefinitely undetermined. With the absence of any information pertaining to the season of the year in which this disease is most frequent, it might be reasonable to infer that its increased frequency and death rate in the Southern states indicate that it occurs more frequently during the summer months. This would be a logical conclusion if it is found to be less frequent and deadly in the arctic regions.

Eclampsia seldom occurs before the fifth month of gestation, but gradually increases in frequency

HEALTH OFFICER'S REPORT.

City.	1907.	1908.	1909.	1910.	1911.	1912.	1913.	Total.	Blank.
Cincinnati	1	8	5	6	8	8	....	36	....
Pittsburgh	....	15	8	14	30	16	....	83	....
New Orleans	....	....	....	21	30	....	....	51	30
Chicago	47	55	50	56	60	50	....	318	....
New York City	....	127	160	138	143	161	....	729	....
Boston	....	12	39	20	27	32	....	130	....
Baltimore	28	24	30	22	17	20	20	161	....
Washington	....	17	8	8	15	20	....	68	....
Cleveland	....	6	5	18	12	13	....	54	....
Detroit	13	10	11	16	15	16	....	81	....
Providence	....	13	8	16	20	10	....	67	....
Nashville	....	6	3	3	8	5	....	25	13
Indianapolis	....	4	7	2	5	9	....	27	....
Thirteen cities, total for five years....	....	....	....	....	....	....	18	30	....
For the census zone only: U. S.....	1,470	1,619	1,706	1,824	2,094	....	....	....	....

until full term of gestation, though it has been known to occur before the third month.

May not the exciting cause be found in the bite of an insect, the presence of a parasite entering the body by way of the mouth, anus, uterine cervical canal, or urethra, or through the cutaneous structures?

If it is more frequent during the summer months or in a latitude where there are a greater number of warm months, would it not indicate the danger of insects or parasites, which are more numerous then?

What relation does the so-called eclamptic state in the female have to the so-called uremic conditions in the male?

The presence of albumin in the urine of the pregnant woman is not conclusive that eclampsia will occur with or without one or more convulsions, especially just before, during or after delivery, or before, at, or after full gestation, because convulsions do not always occur when albumin is present to any degree; indeed, eclampsia exists without convulsions or the presence of albumin. It may, however, occur after convulsions or delivery. It cannot then be considered a cause, but it may indicate the absence of an important substance, probably urea, that should be present in the urine in considerable porportion, but which remains in the general circulatory system, both arterial and lymphatic, as the result of acute nephritis varying in degree. Though there does not appear to be any evidence indicating that even a large amount of urea is essential to produce the required toxicity, small amounts being physiologic.

This would indicate that the amount of dosage varies with the individuals, and with the general condition of the individual at a time when the toxic irritation to the central nervous system is produced, if urea be the cause. But this remains undetermined. A certain unknown fulminant toxemia is ascribed as being a cause.

Would the subjects of eclampsia having nephritis before conception have convulsions, so early in life, if they have never conceived? What rôle, if any, does an inhabited uterus play in the tragedy of convulsions? If the presence of a living or dead body within the uterus is the exciting cause, why do not convulsions always occur with such an inhabitant?

If the exciting cause exists within the mother and not within her uterus, why does not the living occupant of the body always have convulsions? Perhaps it does. It often has after birth. Its blood is identically the same in character as that of the mother, containing the same proportion of albumin and urea, which are supposed to have been the bane of the pregnant state. Is it the poison or the condition that produces the poison that causes the convulsion?

The presence of albumin may be due to neoplasm, urea, hysteria, epilepsy, cerebral irritation, diet, cardiac or hepatic disturbances. It is therefore important to differentiate them, though the same doubt prevails with their absence or presence.

If nephritis is due to the presence of gestation, and the two are the cause of eclampsia, should not gestation be terminated immediately? Should it not be terminated abruptly if the presence of the fetus alone has anything whatever to do with causing convulsions?

Surely, the presence of one dead within the uterus would not be tolerated longer than the time necessary to remove it, in the shortest time, and with the greatest safety to the mother. If necessary when dead it is more necessary when alive, because of the possibility of saving two lives.

The many theories pertaining to the reflex disturbances offer no solution to this all-important problem.

Gestation must be terminated by natural or artificial means soon after maturity (280 days), though the legal time has been extended to 320 days, with safety to the mother and the birth of a healthy, living child. This variation in time of gestation is mentioned to refute the statements that 280 days is the legal time, but these are not exceptions in favor of delay in delivery at any period of gestation when convulsions occur. The period of gestation varies with all animals and with the individuals of every particular kind.

In the absence of any knowledge of the unborn child having eclampsia simultaneous with the mother, would not investigation to prove or disprove their existence be important?

The child may be seized with convulsions before or after delivery, and die at once or survive for several hours, as the result of toxins closely associated with uremia.

Antibodies have been suggested as the sole important cause of eclampsia; but, if they are, they have never been discovered.

CELIOHYSTERECTOMY (PORRO)

1. Extraperitoneal stump.
2. Intraperitoneal stump.

Celiohysterectomy (Porro) implies the removal of the uterus with or without its cervical portion in the usual way, and, when applied to Cesarean section, removal of the uterus containing gestation at any period, with or without its cervical portion.

The necessity for removing a pregnant uterus arises when fibroids or infection are in evidence, and when the child has been dead for a number of hours. It cannot be said that any form of hysterectomy should be done when the uterus is abnormal, or the pelvis is deformed for the purpose of preventing conception because the removal of the tubes alone will overcome that. To these may be added the ovaries in a limited number of cases when menstruation is to be prevented, but the ovaries should, when possible, remain undisturbed, because a normal is easier than an artificial menopause.

Extraperitoneal stump, fixing the stump permanently in the abdominal wall, was formerly given preference. This method antedates the intraperitoneal stump method, and should continue to be the method of choice in infected cases and rupture of the uterus.

Infection is the most serious of the uncontrollable complications of pregnancy that is to reckoned with surgically, because of the high maternal mortality, with or without operation. For this reason a great number of operators refuse absolutely, and many hesitate, to render surgical assistance. Infection in the great majority of cases is primary to the operation; and the mortality is very high, while it is very low with infection secondary to the operation.

Detection of secondary infection, especially its type, before operation, is not always possible, but if it were the course of procedure should not be changed.

A dead child should, as a rule, demand this method of procedure, especially if it be dead for any great number of hours, because of the difficulty in determining the presence of infection or the state of decay in the child.

Uterine rupture, while not frequent, occurs often enough to be considered at all times; and when present there should be no question as to the adoption of the extraperitoneal method.

The intraperitoneal method implies severing the body of the uterus from its cervical portion that the latter may be covered with peritoneum, and the abdominal wall closed immediately. This is the method of choice in cases of uterine neoplasms and anomalies, multiple pregnancies after the sixth month, and intra-abdominal neoplasms involving the uterus without infection.

INDICATIONS.

1. Neoplasms of the uterus.
2. Intra-abdominal neoplasms.
3. Anomalies of the uterus.
4. Multiple pregnancy after the sixth month.

Uterine neoplasms vary in size, location, and number, and for this reason abdominal section should be done to determine the condition within that cavity, the course of pursual to be determined when the abdomen is open.

Intra-abdominal neoplasm, such as ovarian, mesenteric, retroperitoneal, and intestinal cysts and solid growth of any character are frequently associated with eclampsia to such a degree that the removal of the uterus is necessary by one of these two methods.

Anomalies of uterus are of many kinds, and often require hysterectomy by one of these two methods when eclampsia is present or absent.

Multiple pregnancy after the sixth month may be within the uterus alone, or within and without the uterus simultaneously, and when associated with eclampsia may probably necessitate hysterectomy by one of the two methods herein suggested.

SURGERY

1. Intraperitoneal.
2. Extraperitoneal.

The purpose of assembling universal conclusions is to discover one composite which will direct a certain procedure, surgical or non-surgical, that will lessen, if not altogether eliminate, mortality.

The object of this work is, therefore, to supply data pertaining to eclampsia treated by suprapubic Cesarean section other than the lateral method.

The most exhaustive work of Dr. Ruben Peterson, of Ann Arbor, on "Vaginal Cesarean Section," is sufficient within itself to make it necessary to give that subject consideration.

Surgical. The number of surgical aspects of puerperal eclampsia increases with knowledge of conditions and surgical technic. That the trend of

relief is in the direction of immediate artificial evacuation of the uterus is self-evident, and that many cases may go to normal delivery with safety to both mother and child, there can be no question. But how to classify the two will probably remain in doubt. Until that doubt is eliminated ways and means must be considered that will offer the greatest safety to both mother and child. It would therefore appear from the foregoing statements that the most rational method is offered in celiohysterectomy done by one of the various methods generally advocated.

Ambulancing. Desperate symptoms demand desperate means of relief regardless of environment. One who is drowning cares not whether he is favored with a straw or a pack of corks so long as it is the best that can be had to save his life. A surgeon should not hesitate to demand that a Cesarean section be made before manipulation of any kind is resorted to. Then, and not until then, will cases in the hands of certain practitioners have their best interests conserved. Time spent in dilating, or attempting to dilate, the cervix is wasted, and adds to dangers; such as infection, trauma, and hemorrhage incident to delay. It is to be lamented that the death of the child is given so little consideration, many operators having not made any report pertaining to its mortality.

Suprapubic Cesarean section is performed by two methods and their variations, namely (1), intraperitoneal and extraperitoneal.

Intraperitoneal, the time-honored method, remains the one of choice, and should be given preference in the greater variety of conditions demanding the immediate evacuation of the pregnant uterus after the sixth month. The transverse incision for abdominal Cesarean section was made in 1797 in Germany, but was little known until Fenestiel made it popular.

Dr. J. L. Forwood has done forty-two intraperitoneal sections for all causes in ten years. He formerly lifted the uterus out of the abdominal cavity before incising it; but he now incises it, and delivers without doing so, the hands of an assistant being utilized for grapsing the lower segment of the uterus to control hemorrhage. He does not cut low down in the lower segment.

EXTRAPERITONEAL CESAREAN SECTION.

1. Lateral.
2. Median.

The lateral method has been done for many years, but has fallen into disrepute because of the very high mortality attending its doing.

The median method is of more recent origin, and bids fair to grow in popularity in properly selected cases.

Dr. Barton Hirst, who is partial to this method and has done nine of the ten thus performed, describes it as follows:

"An incision large enough to permit the extraction of the child's head is made below the umbilicus. After making the incisions in the two layers of the peritoneum they are sutured together, which immediately closes the peritoneal cavity, making the operation extraperitoneal. Then follows the incision in the uterine wall, made in the ordinary way, and the extraction of the child's head with forceps. The lower uterine segment is sutured with double catgut; and the abdominal wall is closed in the usual way. It has been found to increase hemorrhage if the placenta is delivered from the uterine wound. It is rather better to clip the cord off, drop it into the uterus, suture the uterus, and deliver as usual. If the woman is not in labor, it is necessary to extract the placenta through the uterine wound.

Dr. John B. Deaver inclines to this method, though he believes the danger to the child to be greater.

Dr. Wm. R. Nicholson, who has witnessed six operations performed by this method, advocates it in selected cases without infection, while Dr. E. E. Montgomery states that there is no great demand for the extraperitoneal operation in the absence of infection.

Dr. E. P. Davis welcomes most heartily a method through a peritoneal fistula, though he would not employ it in the presence of hemorrhage or infection or where infection is suspected. In our experience Cesarean section is indicated in eclampsia in not more than 20 per cent. of cases. It should, however, be promptly performed if improvement does not otherwise follow.

INDICATIONS FOR CELIOHYSTERECTOMY.

After sixth month when associated with eclampsia.

In the order of their supposed frequency.

Any other condition or circumstance that would cause delay in prompt and rapid delivery.

An undilated cervix is a serious factor because of the want of uterine effort and the great danger through time necessary to dilate and deliver.

Deformed pelvis is prima facie evidence that the abdominal route should be selected.

A large fetal head is an indication that delivery through the abdomen should be resorted to, that the best interest of both child and mother may be conserved. This is done by shortening the time nec-

essary for delivery, and avoiding a great amount of trauma incident to the route per vaginam.

A dead child (recently dead) should probably be removed suprapubically, oftener during the eclamptic stage than one that has been known to be dead for several days, because the dangers of infection are not so great with the first, while with the second it may be removed sectionally more rapidly per vaginam, and probably with no greater risk of infection.

Absence of labor pains, associated with eclampsia, demands careful consideration, especially at full term, without dilation of the os. Uterine contraction cannot be hoped for under such circumstances after delivery by any method.

Malposition of the child adds to the amount of time necessary to delivery, and must add to the danger to the life of both mother and child.

Neoplasms (intra-abdominal) are quite commonly present with the pregnant uterus at the time of eclampsia. Such complications are of many varieties, and, as a rule, demand celiohysterectomy, that the greatest safety may be given to both the mother and child.

Elongated cervix, so frequently found in primiparae, is a serious handicap when delivery is attempted per vaginam, especially when eclampsia is complicated with hemorrhages, even though the os be dilated.

Uterine hemorrhage, when uncontrollable, due to any cause, should be an indication for delivery suprapubically, especially if the loss of blood is sufficient to endanger life, because the further loss of blood to any considerable amount may be absolutely prevented.

Placenta previa, though rarely complicating eclampsia, is probably the most serious, because of hemorrhage, the danger of infection, and the jeopardy in which the life of the mother and child are placed.

Cervical neoplasms, malignant or benign, like scar-tissue, resulting from injury, disease, or surgical operation, especially amputation of the cervix, may be sufficient to prevent dilatation without the use of instruments.

Vaginal neoplasms of any character, or cysts, may, owing to their size, prevent or interfere with rapid delivery, and such pathology involving the rectum or coccyx, like their deformities, may also be troublesome.

Malformed vagina, such as may be congenital or acquired by injury or disease or surgical repair, is not infrequently encountered in delivery.

Deformed uterus may be congenital, or acquired by injury, disease, or surgical operation, and when found to exist is a sufficient cause for resorting to the suprapubic route.

Rupture or perforation of the uterus absolutely demands abdominal section.

Labial hernia, though of rare occurrence, is a possibility, and when present is to be reckoned with as a serious condition, demanding the suprapubic operation.

Infection is the most serious regarding mortality, doubt always existing as to the propriety of doing any kind of an operation whatever for the extraction of the child in the absence of eclampsia; but, when eclampsia exists, there should be no hesitation about emptying the uterus in the quickest possible manner, because the child, if dead, must not remain, though the mother may be reckoned fatally ill. If the child be alive and of seven, eight, or nine months gestation, it may survive though the mother does not recover. It would be criminal to permit the mother to die undelivered of a dead or a live child by some one of the recognized methods, one which would insure her the greatest safety so long as man is not infallible.

If the mother is moribund or convulsions are frequent or severe, the child should be saved by any means, rapid delivery offering the greatest safety. Duhrssen says operate after the first convulsion.

BIBLIOGRAPHY.

Halbertsman: Eklampsia gravidarum eine neue Indikationstellung für die Sectio Cesarea. Ref. Zentralblatt für Gynäkologie, 1889, p. 901.
Hillmann: Ein Fall von Sectio Cesarea angeführt wegen Eklampsie. Monatschrift für Geburtshilfe und Gynäkologie, 1899, Band x, pp. 193-207.
Olshausen: Sectio Cesarea wegen Eklampsia. Zentralblatt für Gynäkologie, 1900, p. 63.
Sammlung Klinischer Vorträge Neue Folge, No. 39, p. 328.
Strieckeisen: Zentralblatt für Gynäkologie, 1903, p. 1072.
Bumm: Die Behandlung der Eklampsie. Deutsche Medizinische Wochenschrift, 1907, Band xxxii, pp. 1945-1947.
Sir J. Halliday Croom: Transactions of the Edinburgh Obstetrical Society, 1903-1904, vol. xxv, p. 194.
Herman: Transactions of the Medical Society of London, vol. xxv, 1902, p. 224.
Zweifel: Zentralblatt für Gynäkologie, 1895, pp. 1201, 1218, 1238, 1256, 1265, 1277.

(To be continued.)

SEMINAL VESICLE INFECTION.

So far as we have gone, we can say that:

1. Vesiculitis may occur from infection with tubercle bacillus.

2. When one vessel is involved its fellow may also be safely accused.

3. Radiograms with collargol seem already to demonstrate the presence of inflammatory changes, and their future as a diagnostic aid seems bright.

4. Dense adhesions, usually surrounding the junction of vas and vesicle, not only make operation difficult, but in most cases would make successful separation of the two structures impossible.—J. D. BARNEY in the *Boston Medical and Surgical Journal*.

THE TRANSFIXION TREATMENT OF FEMUR FRACTURES.*

JOHN J. MOORHEAD, M.D.,
NEW YORK CITY.

Some fractures of the shaft and ends of the femur are very hard to manage when the fragments are much mal-aligned by overlapping, lateral and other displacements. In these, the ordinary methods of extension by Buck's or other apparatus frequently prove ineffective and in others the nature of the injury or the condition of the patient prevents the use of such contrivances.

At best these usual methods of treatment are not uniformly successful and often considerable shortening, angulation and other deformity persists, together with more or less stiffness of the knee and hip joints. Recognition of these unfavorable results has popularized the operative or open treatment of these cases by plating, wiring, bone transplantation and other procedures. However, these operative measures are of a major type and require a high grade of technical skill and are not uniformly successful either as to the immediate or final results. A cardinal objection is that the operative work is done in an already traumatized area which is still further irritated by the introduction of foreign bodies represented by wire, or plate and screws. Manifestly this form of treatment can never come into general use and it is now quite properly limited to selected cases under the direction of experienced operators. Between the extremes of non-operative and operative methods are devices of various sorts which are introduced at a distance from the fracture site, inasmuch as these do not invade a territory already sufficiently damaged by the initial trauma and do not require such advanced operative skill. These appliances take the form of metal pins driven into the fragments to be later separated or otherwise acted upon by braces or clamps, as in Parkhill's, Freeman's and other devices. Other modifications of this general type have from time to time appeared, all seeking the essential element of correcting vertical or lateral displacement. Various sorts of hooks and tongs have also been employed with the same ends in view. For fracture of the extremities, transfixion of the os calcis by a metal pin or rod was first suggested by Codivilla of Bologna in 1903, but Steinman of Berne in 1907 suggested transfixing nearer the lower fractured fragment by a nail and focused attention so forcibly that the title "Steinman's Nail Extension" is now quite generally applied to this method of treatment. The essential aim of the method is to obtain traction by driving a metal pin, nail or drill through the skin, soft parts and bone of the distal fragment, allowing enough of the metal to protrude on either side of the skin so that traction cords may be fastened to its side and thus lead to a pulley and weights or springs at the foot of the bed. By this means a direct measurable pull is obtained so that the fragments are gradually dragged into position by overcoming the muscular resistance. No apparatus except that attached to the transfixer is ordinarily required, aided by some form of inclined plane to keep the knee semi-flexed during the succeeding weeks of transfixion.

A variety of transfixers have been devised, some of them in two pieces, each half being separately introduced on either side of the limb; others are inserted after a preliminary hole has been made. My experience has been wholly with an ordinary steel bit or drill such as is used for boring holes in wood or metal, and this is allowed to remain in place until it has served its purpose. An ordinary "brace" has been used for boring the hole, but an electrically driven apparatus, of course, will act as well if it is not revolved too swiftly.

INDICATIONS FOR FEMUR TRANSFIXION.

1. Fractures in which ordinary methods are inapplicable or inefficient. These are usually very oblique, spiral or transverse fractures showing considerable deformity from displaced fragments in which traction on the soft parts alone is likely to prove inadequate.

2. Compound, comminuted or complicated fractures in which the parts at or near the fracture site itself cannot be interfered with.

3. Restless, delirious or otherwise uncontrollable patients; also the aged or infirm in whom decubitus might prove dangerous.

4. Old fractures showing non-union or vicious union in which recorrection is made preliminary to transfixion.

5. Certain fracture-dislocations, or multiple fractures.

6. To obtain preliminary alignment prior to plating or other operative procedures.

TIME OF APPLICATION.

As soon as the diagnosis is established the treatment may begin. Preliminary measurements should always be made, and when possible radiographs should be taken in the antero-postero and lateral axes. It is not necessary to wait until swelling or other reaction subsides, and the presence of the

* Read before the New York and New England Association of Railway Surgeons, October, 1913.

usual effusion of the knee joint offers no contra-indication.

METHOD OF APPLICATION.

The *length* of the transfixer is such that one inch or more protrudes on either side so that the traction cords may have ample room for attachment. If desired, a metallic crossbar shaped like ice tongs may be used to span the space between the transfixer, the cords being attached to either free end.

The *diameter* of the transfixer is three-sixteenths of an inch or less for a child, and five-sixteenths of an inch or more for an adult.

The *Drills* used by me are known to the hardware trade as "high speed twist drills," although commercial "twist drills" will answer for ordinary cases. I have used "auger bits" and other transfixers with short cutting surfaces, but these clog and bind and do not so readily transfix the tissues because of a limited clearance space. I am having special vanadium drills made so that there will be no chance of breakage.

The *Brace* should be short and strong and I have found the ordinary "Yankee" type very satisfactory for this and other bone work.

TECHNIC.

The patient is anesthetized and the shaved limb is painted with tincture of iodin and the knee is partly flexed on a sand-bag and held by an assistant. The condyles of the femur are located, or if obscured by thick tissue or swelling they can be identified by recalling that the upper border of the patella and the condyles are practically in the same line when the knee is flexed at a right angle. The transfixion is made two or more inches directly above the level of the condyles so that the joint and epiphyseal line may not be damaged. Great care must be taken to avoid the popliteal and synovial pouch regions. At the selected point above the external condyle, a semi-circular one-half inch incision (concavity downward) is made down to the fascial level. A director is now inserted to the bone and firmly held there by an assistant, and along this as a guide the drill is passed. The soft parts may be protected somewhat by spreading them away from the drill with a long bladed ear or other speculum used as a retractor. The assistant steadies the limb by firm pressure and guides the direction of the drill so that it passes directly at a right angle to the axis of the bone. When it has penetrated the soft parts and bone, it is made to impinge against the skin on the inner side of the limb and then is pushed through a half inch semi-circular incision identical with that of the opposite side. There is usually very little bleeding. The wounds are touched with iodin and the drill ends are thrust through a few layers of gauze padding and the wounds thus covered. A few straps of adhesive or a bandage completes the dressing. The procedure requires about ten minutes and in selected cases can probably be performed under local anesthesia, with the patient in bed.

After the patient is in bed the limb is placed on raised pillows or any form of padded double inclined plane reaching from the heel to the buttock, the knee being at an angle of about 120°. The foot of the bed is elevated eight or more inches and then cords are attached to each end of the protruding drill and brought together at a "Spreader" and thence one cord leads to a pulley at the foot of the bed and thus to the dangling weight. For children, a weight of eight pounds is enough for the first day, and within a week it should be increased gradually up to fifteen or more pounds. With an adult, the weight is doubled. In the children I have treated (eight cases) the maximum weight has been fifteen pounds; in adults (three cases), thirty-six pounds. Restless patients may require some lateral guy weights to keep the limb straight, but I have found elevation of the foot of the bed a good form of counter-traction, and side pulls thus far not often necessary. For the first few days a good deal of pain may be expected, but thereafter the patients are remarkably comfortable, considering what is apparently a very cruel process not unlike crucifixion. The patients have considerable lateral motion and can sit almost bolt upright in bed and the problem of nursing care is thus lessened.

Weight traction is usually effective after two weeks and this can be verified by measurement or radiography. If deformity has been overcome the drill may be extracted and then a plaster of Paris spica is applied and this is worn four or more weeks until union is sufficiently firm to allow the patient out of bed. In selected or otherwise controllable cases it is preferable to continue the traction with a lessened weight for four weeks or more, and then the drill is removed. No great pain occurs when the drill is extracted as it usually is quite loose in the bone although tightly gripped by soft-part granulations which bleed slightly when the metal is withdrawn. Massage can begin after the first week and some passive motion of the knee can be given at the third week. Joint motion, however, will be found well preserved because of the lack of complete immobilization.

After union is firm, treatment is the same as under any other form of management. In some frac-

tures very close to the knee joint as in the supracondyloid variety, transfixion can be made through the head of the tibia, and indeed this site is advised by some as the place of election in fractures of any portion of the shaft of the femur. It has not appealed to me because of the tension imposed on the undamaged knee joint, although this appears to be a theoretical more than practical objection.

Fracture of the neck of the femur has also been treated by transfixion, and the cases suitable for the position of abduction should be very readily controlled by the procedure as the direction of the traction-pull is easily arranged.

OBJECTIONS.

1. *The bone is not completely immobilized.* This is not a real defect, as union will be firmer and quicker than if the parts were in absolute fixation.

2. *Necrosis may be induced by the drill.* This has not been caused in the cases thus far reported and the radiographs indicate no osteoporosis or other bone changes. The fact that the drill is so easily extracted would seem to indicate that the bone sought to expel the drill by erecting a barrier of osseous granulation, in effect regarding it as a foreign body.

3. *Infection is carried from without in.* This sometimes occurs in any operation, but there is nothing inherently dangerous in this technic.

4. *Lateral deformity is uncorrected.* This in a measure is true; but apparently it is not an essential element, for if the over-riding is effacted the functional result will be good. Lateral traction and vertical suspension surcingles may in part correct this.

ADVANTAGES.

It is an intermediate measure between the closed or non-operative methods (Buck's Extension and the like) and the open or operative radical methods (plating or wiring). It is less hazardous and perhaps more generally applicable than plating because the procedure is (a) simple; (b) the scene of operation is at a distance from the traumatized area; (c) no foreign body is left in the tissues; (d) the parts are always exposed during healing; (e) joint stiffness is minimized; (f) atrophy, joint-stiffness and decubitus can be controlled.

It is by no means adapted to all sorts of cases and is not recommended where ordinary forms of extension suffice, nor when plating or transplanting seem more likely to be efficacious either because of the nature of the injury or the availability of a surgeon skilled in that work. It is a simple operative procedure readily performed by the average surgeon with a minimum of risk and paraphernalia and it can be done at the patient's home if necessary.

The transfixion feature may well be used preliminary to plating, thus obviating much of the trauma occasioned by efforts to align fragments more or less separated by contracted powerful muscles.

Sufficient time has not elapsed to learn the ultimate effect in the cases herewith reported; but thus far the results promise well and certainly the relief from shortening and other deformity is such that the method should find a place in the treatment of many fractures of the type already mentioned.

The following representative cases are reported showing radiographically the results of the transfixion and they are selected from a group of eleven cases treated since July, 1913, when the writer first began this procedure.

The cases cited from Harlem Hospital were in the service of Drs. John J. McGrath and Irving S. Haynes respectively, and the case treated at the Post-Graduate Hospital was in the service of Dr. John F. Erdman, and to these visiting surgeons I am indebted for the opportunity of treating these patients. The radiograms from Harlem Hospital were made from plates taken by Dr. W. H. Stewart. Dr. I. Hirsch made the plates in the case reported from the Post-Graduate Hospital.

Case I. John S., aged 11, was admitted to Harlem Hospital June 30, 1913, with a compound fracture of the middle of the femur due to being run over by a wagon. Transfixion was done July 3rd, and the drill was removed July 29th and at that time union was fairly firm and there was a lengthening of one-quarter of an inch. A plaster of Paris spica was worn for two weeks thereafter and it was then removed and he was sent to the country for the summer. I am told by our social service department that he has a normal-looking and acting extremity.

Case II. John H., aged 6, was admitted to Harlem Hospital July 7, 1913, with a simple fracture of the upper third of the femur and humerus due to being run over by an ice wagon. He was transfixed July 10th and the drill was removed July 29th and then a plaster of Paris spica was applied as in the preceding case, the injured thigh then showing no shortening. He was presented before the Harlem Hospital Clinical Society in October and his recovery was apparently perfect.

Case III. Peter D., aged 7, was admitted to the Post-Graduate Hospital July 5, 1913, with a fracture of the upper third of the femur due to a fall from a stoop. Transfixion was done July 11, and the drill was removed three weeks later and plaster of Paris applied as in the preceding cases. There was then about one-fourth of an inch lengthening. He has had an excellent anatomical and functional result. There is little if any inflammatory reaction about the holes made by drilling.

Case IV. D. S., aged 31, was admitted to Harlem Hospital Sept. 12, 1913, with a fracture of the lower third of the femur due to being knocked down by falling earth. There was a shortening of nearly two inches and the patient was exceedingly muscular and of heavy build, and the region about the fracture and knee was greatly swollen. Transfixion was done September 18 and the drill was removed October 26 and at that time there was one-half inch lengthening with a fairly large soft callus and some antero-internal bowing. A plaster of Paris cuff was then applied extending from the groin to below the knee and this will be removed about November 18. I feel quite confident that transfixion was the treatment of choice in this case, because the swelling was so great that other forms of extension would have been inapplicable, and open operation exceedingly difficult if not hazardous.

Case V. Wm. Y., aged 7, was admitted to Harlem Hospital Aug. 15, 1913, with a fracture of the middle of the thigh due to falling from and being run over by a wagon. There was a shortening of one and one-half inches and he was in a Buck's extension apparatus until September 25, when transfixion was undertaken because there was little decrease of deformity. The callus at that time was fairly soft and under anesthesia an attempt was made to break it up and a weight of fifteen pounds was then applied to the transfixer. This proved ineffective and on October 13 the fracture was exposed by an anterior incision and a long spicule of partly ossified bone was chiseled through and then traction on the drill readily overcame the shortening. The drill was removed October 27 and shortening of three-eighths of an inch then existed. This case indicates the value of transfixion after another method of treatment proved unavailing.

Case VI. R., aged 8, was admitted to Harlem Hospital July 5th with a comminuted fracture of the middle of the femur, due to being run over by a wagon. Before operation there was a shortening of about one and one-half inches and the radiogram showed a fragment of bone considerably displaced. Transfixion was done July 10 and the drill was removed July 30. At that time there was a lengthening of one-quarter inch and the limb was placed in plaster as in the preceding cases.

EMPYEMA THORACIS.

To discriminate between a purulent and serous fluid is often impossible, though there are many signs which favor the presence of pus rather than serum. It is frequently thought that a hectic temperature is indicative of pus, but I find as high temperatures recorded in my serous as in my purulent cases. When an effusion occurs in a child under three, the probability is strongly in favor of its being purulent, as also when it occurs subsequent to an attack of pneumonia, scarlet fever, or other infectious disease.—H. G. M. DUNLOP in the *Edinburgh Medical Journal.*

LOCAL ANESTHESIA AS EMPLOYED IN THE BIER CLINIC IN BERLIN.

RALPH E. KLECKNER, M.D.,
MATTOON, ILL.

The greater attention recently devoted to the subject of anesthesia, and the greater knowledge of the subject, have revealed dangers that were before unknown, and have shown how very much the ultimate well-being of the patient depends upon the careful selection of the method of anesthesia used. It is quite obvious that some of the remote dangers of some anesthetic drugs are far greater than the immediate; and it does not seem improbable that these sequelae may be more serious and far-reaching than we even now realize. As the dangers of general anesthesia in certain cases have been more fully appreciated, more attention has been devoted to local anesthesia; so much so that if the condition of the patient is such that the administration of a general anesthetic is likely to be especially dangerous, almost any operation of necessity can be performed under some form of local anesthesia.

Until comparatively recent years local anesthesia was very little used on account of the toxicity of cocaine, the agent usually employed. But with the introduction of the comparatively inocuous substance novocaine, considerable attention has been devoted to the subject and great strides have been made in the technics of this form of anesthesia.

Local anesthesia, excluding spinal anesthesia, may be placed under two heads: (1) Local Infiltration Anesthesia. In this case a very weak solution of the anesthetic drug is employed and the whole area to be operated upon is infiltrated with the solution. (2) Regional Anesthesia. A stronger solution of the anesthetic drug is employed, and a small quantity is introduced around the nerve trunks, or a weak solution injected into the veins that supply the part to be operated upon.

I shall merely enumerate most of the operative procedures in which local anesthesia is indicated, and attempt to describe the general technic of Infiltration, Venous and Plexus Anesthesia.

Among the operations that may be successfully performed under infiltration anesthesia are:

Gastrostomy and colostomy (the reason local anesthesia is indicated in these operations is that the patients that require them are usually in a poor condition to take a general anesthetic); the removal of all tumors of the skin, all tumors of the skin and fascia, all tumors of the flat bones, as of the skull;

all forms of hernia, if not incarcerated, or, if there are not extensive adhesions between the hernial contents and sac; appendicectomy, *if performed in the interval* (when the tissues are not inflamed). But an operation for acute (inflamed) appendicitis should never be attempted under local anesthesia, for the reason that the necessary pulling and stretching of the peritoneum is extremely painful, and it is, of course, impossible to anesthetize this structure. The peritoneum can, however, be incised or burnt without causing pain. All operations upon the mammary gland, including amputation (but it is especially indicated in the extirpation of small tumors of the gland). All operations upon the anus, penis, scrotum, and external female genitalia. For incision of abscesses, puncture of pleural exudates, rib resection, and dressing of all wounds. All operations upon the head and neck. All operations upon the extremities. In all the above operations, except those upon the extremities, infiltration anesthesia is usually employed.

Fig. 1. Injection of the anus and rectum.

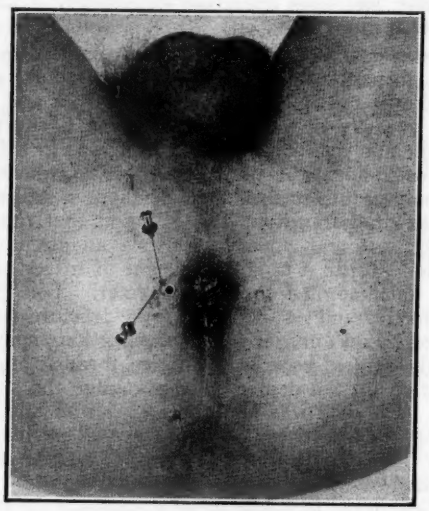


Fig. 2. Needle positions for the injections around the rectum.

INFILTRATION ANESTHESIA.

The anesthesia is produced by the injection of a one-half per cent. solution of novocaine and suprarenalin, except in operations upon the fingers and toes. Here a one-half per cent. novocaine solution, without suprarenalin, is used, with a constricting rubber band to retain the anesthetic fluid in the part.

The general technic of infiltration anesthesia is as follows: Four or more points surrounding the area which is to be anesthetized are injected by placing the point of the needle between the layers of the skin and forcing out the solution until a small blanched spot appears. These points must be connected by an injection which is made into the skin forming a wheal, which must completely surround the area, as otherwise the injection is without value. Anesthesia is produced by bringing the solution into direct contact with the nerve endings. If no wheal is produced it means that the solution has been injected into the subcutaneous tissues and has not come in contact with the nerve endings. To produce this wheal successfully, one must use a long needle and push it forward between the layers of skin and inject the solution as the point of the needle moves forward. This continuous injection does two things: (1) It avoids putting much of the solution into a bloodvessel, should one be punctured. (2) The needle always passes through tissue that has been filled with fluid. The next step is to anesthetize the subcutaneous tissues. This is accomplished by the use of a long needle introduced at the same points that were used in the skin anesthesia. The method of procedure is exactly the same, *i. e.*, the solution is injected as the point of the needle moves forward for the same reasons as given above, except at a lower level. If deeper anesthesia is required, as in the removal of atheroma of the fascia or periosteum, the same rule is followed except at a deeper level.

This technic applies Hackenbruch's principle, *i. e.*, the nerves supplying a part come from all sides at the same level as the part supplied.

Following is an example of the technic of the anesthesia for hemorrhoid operations. The anesthetic used in this, as in most operations, is a one-half per cent. solution of novocaine and supra-

renalin. This solution may be prepared after the following formula:

Novocaine	0.25
Physiological Salt Solution	50.0
Suprarenalin Solution 1 to 1000	5 drops

This is Dr. Braun's solution No. 2. The prepared tablets may be procured in the market.

The typical surrounding injection (Fig. 1), as followed by Reclus, is executed in the following way: Surrounding the anus, four insertion points are to be marked about two or three finger-breadths from the anal orifice. From these a one-half per cent. novocaine-suprarenalin solution is injected by means of a hollow needle 10 cm. long. Beginning

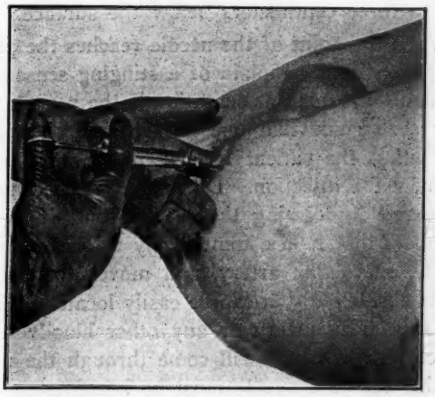


Fig. 3. Injection under the guidance of the finger.

at one of the side points, one pushes the needle first perpendicularly down parallel to the rectum, through the sphincter, and levator ani muscle. The needle is then withdrawn and reinserted its whole length in the direction of the front and back circumference of the rectum. In Fig. 2 the three needle positions are correctly illustrated. At each induction of the needle at least 5 cc. of a one-half per cent. novocaine-suprarenalin solution is emptied out in a continuous injection, and the same process is gone through from the remaining three points, so that at least 60 cc. of the solution is used for this purpose. This is followed by the surrounding injection, from one point to the other, at three different levels—once into the sphincter, once subcutaneously, and once into the skin. For this purpose an additional 40 cc. of the solution is used, making the total at least 100 cc. In very fat subjects 125 cc. should be used. It is possible to execute these injections without the finger in the rectum, but to the unpracticed it is better to control the point of the needle under the guidance of the finger in the rectum (Fig. 3), and one must feel its point above the sphincter and beneath the wall of the rectum.

In women, the anterior injection may be controlled from the vagina. If, on account of great pain, as in anal fissures, it is impossible to introduce the finger, the advice of Reclus may be followed, viz., to first make the mucous membrane analgesic by putting in a cotton tampon soaked in a two per cent. alypin-suprarenalin solution. The practiced surgeon will find this measure dispensible, for the reason that the finger will not have to be introduced into the rectum. After finishing all of the injections, the sphincter slackens and can be dilated, excised or burnt, according to pleasure.

VENOUS ANESTHESIA.

In 1908, Bier discovered a new way to bring the anesthetic in contact with the nerve substance. He injected novocaine solution in an exposed subcutaneous vein in an extremity that had previously been rendered bloodless by a rubber bandage. His experiments had shown that the vein walls were

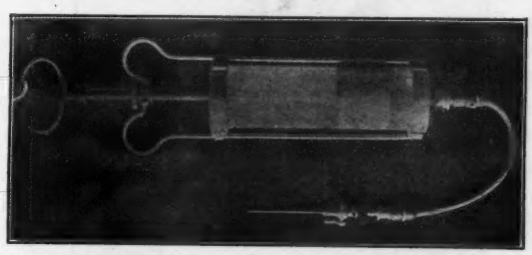


Fig. 4. Syringe and canula for venous anesthesia.

extraordinarily penetrable for watery fluids. The injected fluid therefore passed very quickly through the whole cross-section of the extremity between the ligating bandages and produced within this territory terminal anesthesia. He called this direct vein anesthesia. Since the nerve trunks passed through this territory, conduction anesthesia was produced in all parts of the extremity lying distal to the ligating bandages. He called this indirect vein anesthesia.

The technic for vein anesthesia is as follows: The whole extremity is made surgically clean. The limb is elevated, the vessels are rendered bloodless by a sterilized rubber bandage, which is tightly wrapped, beginning at the toes or the fingers, and extending above the knee or elbow, as the case may be. At the upper limit of this expulsion bandage a second rubber bandage is applied tightly around the extremity. Now the expulsion bandage is unwrapped for a distance of not less than one hand's breadth, or more than three hand's breadths, from the compression bandage, and here a second ligating bandage is applied. One of the large subcutaneous veins between the two compression bandages is now laid bare under infiltration anesthesia.

It is well to mark the location of the vein on the skin before the bandages are applied, as otherwise it may be difficult to locate.

The vein is now opened, a venous canula with two circular grooves near the distal end and a stopcock near the proximal end is tied firmly in place within the vein and a 100 cc. syringe (Fig. 4), with a thick walled rubber tubing about eight inches long is used to force the solution into the vein. Considerable force must be exerted to force the solution through the collateral branches of the veins in the ligated section of the limb.

The solution used is one-half per cent. novocaine *without suprarenalin*. In the upper extremities 40

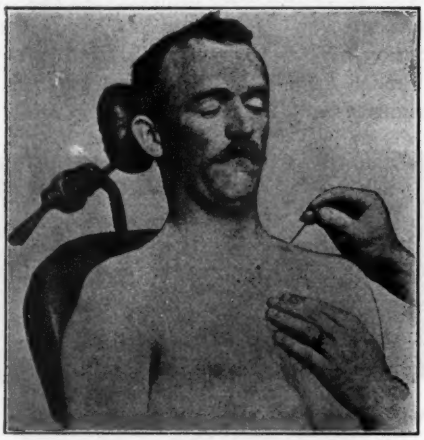


Fig. 5. Point of injection for brachial plexus anesthesia. (After Kulenkampff.)

to 50 cc. of the solution are injected and in the lower extremities 70 to 100 cc.

When the veins are necessarily cut during the operation they should be immediately clamped, or tied, so as to prevent loss of the solution. One must wait from five to fifteen minutes for perfect anesthesia to take place, and at any time should the distal compression bandage interfere with the operation it may be removed, for anesthesia will remain until the upper compression bandage is removed.

Venous anesthesia is indicated in all operations upon the extremities, except in the presence of senile and diabetic gangrene. When these conditions are present, plexus anesthesia may be used in its stead.

PLEXUS ANESTHESIA.

The technic of the plexus anesthesia is as follows: The patient should be in an erect sitting position or as nearly so as possible. A thin, hollow needle from three to six centimeters long is used for the puncture.

The injection of the brachial plexus is made at the point where it passes beneath the clavicle. This lies just external to the point where the subclavian artery passes beneath the clavicle.

In thin patients it is sometimes possible to see the pulsation of the artery at this point. But if this cannot be done, one places his finger near the middle of the upper border of the clavicle and the pulsation of the artery can be readily felt. The needle is now introduced at a slight angle, as shown in Fig. 5, just external to the artery and close to the upper margin of the clavicle. The depth of the plexus depends upon the amount of fat in the region, but in most cases the plexus lies from one to three centimeters below the surface.

When the point of the needle reaches the plexus, the patient will complain of a stinging sensation in the hand or arm; this sensation in the patient is the only sure guide that one has reached the plexus, and unless the patient feels it, it is almost useless to make the injection. Difficulty is sometimes experienced in locating the plexus, but, if one remembers that it lies immediately to the outer side of the subclavian artery, and moves the point of the needle slightly, it can be easily located. Should the subclavian artery or any other bloodvessel be punctured the blood will come through the needle. In this case the needle must be immediately withdrawn and introduced again, for it would be extremely dangerous to inject the solution directly into the circulation. After the plexus is located the needle must not be moved, but the syringe is attached and 10 cc. of a two per cent. novocaine and suprarenalin solution injected. The injection may go directly into the plexus or immediately around it; the result is the same.

In from one to three minutes anesthesia and partial motor-paralysis should begin to appear, and in fifteen minutes these should be complete. If, however, at the end of this time the anesthesia is not perfect and the motor-paralysis is not complete, 5 cc. of four per cent. novocaine suprarenalin solution may be injected through the needle, which has been left in place.

This anesthesia is applicable in all operations upon the hands and arms, including amputation below the level of the middle of the upper arm. Should the operation be above this point plexus anesthesia must be combined with infiltration anesthesia.

Plexus anesthesia should never be used on both sides of the body at the same time.

DEMAREE BUILDING.

STRAIGHT DIRECT LARYNGOSCOPY, BRONCHOSCOPY AND ESOPHAGOSCOPY.

RICHARD HALL JOHNSTON, M.D.,

Clinical Professor of Laryngology in the University of Maryland; Laryngologist to St. Joseph's German Hospital; consulting Laryngologist to the South Baltimore Eye, Ear and Throat Hospital; the Jas. L. Kernan Hospital for Crippled Children.

BALTIMORE, MD.

(*Continued from August Number.*)

CHAPTER VII.

DISEASES AMENABLE TO TREATMENT BY TRACHEO-BRONCHOSCOPY.

Tracheitis. Those cases of tracheitis which do not respond to ordinary treatment can often be cured by topical applications through the bronchoscope. "Grip" tracheitis, which affects usually the anterior tracheal wall an inch or two below the larynx, and which shows itself through the laryngoscope or bronchoscope as redness and some thickening of the mucus membrane, and which often has a tendency to hold on for months despite treatment by cough remedies and external applications, is usually quickly cured by a few applications of nitrate of silver (2 to 10% solution). In some cases one or two applications will accomplish wonders, while in others more will be needed to cure. The highest number of applications made by the writer was ten. A few months ago a lady, 30 years old, consulted the writer for a cough of five months' duration, the sequel of an attack of "grip." She had tried all sorts of drugs with only temporary relief. The bronchoscope, which was passed with the head in the straight position, showed redness and swelling at the "point of election," about two inches below the larynx. Six applications of nitrate of silver were made to the trachea through the bronchoscope with the result that the cough disappeared. The applications are usually made twice weekly, beginning with the 2% solution and gradually increasing to the stronger solutions. Since the trachea is not sensitive, little or no anesthetic is required. Some years ago the same kind of a cough in a woman was cured by a few applications as described above; she had previously been treated for months with sprays, inhalations, and cough remedies. Treatment through the bronchoscope cannot be too warmly commended; with it many chronic tracheal conditions can be greatly improved if not cured. In the enthusiasm of the removal of foreign bodies, one is apt to forget that bronchoscopy has other valuable uses in the treatment of tracheal and bronchial affections. While the treatment of diseased conditions is not as spectacular as the removal of a foreign body, one earns the everlasting gratitude of patients by curing a troublesome cough which sometimes robs the sufferer of all interest in life.

Ulcer of the trachea. Formerly it was thought that all ulcers of the trachea were tubercular or specific; thanks to studies through the bronchoscope it is now a well established fact that catarrhal ulcers are not uncommon and can be cured by topical applications of nitrate of silver. Some years ago a young woman was referred to the writer with the history of a severe, tickling cough of several months' duration, which, despite all cough mixtures, did not allow a full night's sleep. The history of tuberculosis in the family and the fact that she was losing weight convinced the relatives that she had that disease, though no bacilli could be found in her sputum. The patient located the tickling just above the bifurcation; a prolonged stay in another climate did no good and she decided to try bronchoscopy. Though she was very nervous, the bronchoscope was passed; careful examination of the trachea revealed nothing abnormal until, about an inch above the bifurcation, a well defined ulcer was seen with its base covered with grayish exudate which, when wiped away, exposed the base, which bled slightly. Applications of nitrate of silver were made twice weekly for several weeks until the ulcer healed and the cough ceased. The patient had a deviated septum which was corrected by the submucus method. She immediately began to gain in weight and has since remained well. Equally gratifying results have been reported by Jackson and others. While "one swallow does not make a summer," this case proves conclusively that catarrhal ulcers do occur in the trachea and can be cured by proper treatment. In all obscure coughs without tubercle bacilli, the bronchoscope should be passed and careful search made for tracheal lesions. In this patient the separable speculum was used to pass the bronchoscope because the writer had not at that time learned the straight position which would have made examination and treatment much easier. In nervous patients the writer knows from experience that the straight position simplifies the examination very much.

Tumors of the trachea. Before the introduction of the bronchoscope tumors of the trachea were practically a sealed book, except those high up in the tube, which could sometimes be seen with the mirror. Since the use of the bronchoscope has become general, quite a number of tracheal tumors have been reported. Mayer has recently reported

a papilloma in the bronchus of a child which caused dyspnea and which was successfully removed through the bronchoscope with complete relief of symptoms. Three years ago a remarkable case came under the writer's observation. A woman, 35 years old, who had been operated upon six months previously for a large cervical gland, the pathological character of which was not definitely determined, developed shortness of breath. Her family physician was inclined to attribute the symptoms to nervousness, as was the surgeon who had operated upon her, since, whenever they saw her she was quiet and accordingly better. She insisted that her breathing was gradually growing worse, so Dr. J. J. Carroll examined her throat, but could make out nothing definite with the mirror. He then asked the writer to pass the bronchoscope. The patient was extremely nervous and, since it was before the day of straight bronchoscopy, the writer had some difficulty in passing the 5-millimeter tube. This was finally accomplished, however, and a good view of the trachea obtained. Below the thyroid gland a large tumor was seen growing by a broad base from the left wall of the trachea and leaving a small slit between the tumor and the right wall of the trachea through which the patient was breathing. The surface of the growth was nodular with numerous large blood vessels coursing over it. Since the tumor was so large and seemed so full of blood, it was thought best not to attempt removal of a piece for microscopic examination. It was realized that if interference caused serious bleeding, the patient would probably choke before anything could be done. The only method that offered any hope of relief was from outside operation. The patient was advised to come into St. Joseph's Hospital at once so that she could be constantly watched. A few days later, Dr. A. C. Harrison did a preliminary tracheotomy and shortly afterwards enlarged the tracheal wound and removed as much of the growth as was possible. He found that it extended some distance down in the trachea, and Jackson's long tracheal canula was introduced. The microscopic diagnosis was endothelioma. The patient has had several operations and is still living four years after the first operation with the aid of a long tracheal canula. She cleans and replaces the tube herself, is able to talk and seems to enjoy life. In this case diagnosis with the mirror was not possible, and it is probable she would have asphyxiated if the bronchoscope had not been used.

A woman, 62 years old, was referred to the writer by Dr. James Bordley for expectoration of blood for some time. The patient was well nourished and nothing could be found to account for the blood. Eight months before the writer saw her, Dr. Bordley had removed the left eye for sarcoma of the ciliary body. The patient had an almost constant cough which prevented sleep. Under alypin anesthesia with the head straight, the 9-millimeter bronchoscope was passed without the separable speculum. Nothing abnormal was seen in the trachea or upper bronchi. When the terminal bronchi on the right side were reached, a fringe-like tumor was seen in one of them just where the tertiary bronchus came off. Blood appeared in this bronchus and when wiped away quickly reappeared. Unfortunately, the writer had no forceps small enough to remove a piece for microscopical examination; in appearance the tumor resembled a papilloma. In this case, Dr. T. R. Boggs had previously made a diagnosis of bronchial obstruction.

A few weeks ago a lady was referred to the writer by Dr. Bordley for expectoration of blood of two years' duration. There were no symptoms of tuberculosis and the lungs had been pronounced sound by Dr. Boggs. The blood, as a rule, would appear two or three hours after exercise such as horseback riding or dancing. The greatest quantity that had appeared at one time was about two ounces and always as clots. She had dilated veins at the base of the tongue which, after cauterization, did not stop the hemorrhage. Dr. Boggs, from the physical signs, thought there was some trouble in the left bronchus, probably a stenosis. Though the patient was very nervous, the 7-millimeter bronchoscope was passed at the first sitting, but just as the tube was about to enter the left bronchus, she became so restless it was thought best to remove it quickly to prevent possible injury. In this case the use of the separable speculum would have been absolutely impossible. The bronchoscope was passed with the head straight. The patient was given bromide of soda and told to return in a week for a second examination. After alypin anesthesia, the bronchoscope was again passed, and the bronchus examined; a narrowing of the lumen not sufficient to interfere seriously with breathing was found. No dilated blood vessel was seen and the origin of the bleeding could not be determined. In this case the small laryngoscope which was used in anesthetizing the larynx and trachea was tolerated badly, and bronchoscopy with the separable speculum would not have been possible.

Chronic bronchitis. Literature on the direct treatment of chronic bronchitis is scarce. Applica-

tions through the bronchoscope would seem the rational treatment, especially in young and middle-aged people. In a patient seen by the writer two years ago expectoration was so thick that when a bottle containing it was held upside down it would not run out. This patient had not had a comfortable night for years on account of attacks of asthma whenever the prone position was assumed. Bronchoscopy with the application of nitrate of silver of increasing strengths (from 2 to 10% solutions) was practiced with the result that the secretion changed to a thin, almost watery, character and became very much less in quantity. The asthma disappeared completely. Though the patient is not entirely well, his condition is much better and the results encourage the hope that with prolonged treatment he will recover entirely. In connection with this case the writer wishes to emphasize the dangers of cocaine as a local anesthetic in tube work. During one of the first examinations, a small quantity of 10% solution was used in his larynx and trachea. The patient left the operating room in good condition and soon afterwards insisted on leaving the hospital. He took a car and went uptown to get supper. He remembered nothing after paying his bill in the restaurant until he "awoke" the next morning in the University Hospital. At 9:30 o'clock that night he was arrested for being drunk and disorderly on the street; two policemen had all they could do to take him to the station house, where he had to be restrained to prevent his doing himself bodily harm. At 11:30 o'clock the writer received a message from a friend of his that, though he had an engagement to spend the evening with her, he had not appeared. To make a long story short, one of the resident physicians at the University Hospital, at the writer's request, went to the station house and, finding him quieter, took him to the hospital, where he was put to bed and watched all night by internes. The next morning early he seemed perfectly rational. When the writer saw him the second time between 1 and 2 o'clock, he was wild again. It turned out that he had had a hypodermatic injection of atropine; when the effects of this wore off, he was himself and soon made a prompt recovery. He then told the writer that the application of a belladonna plaster had caused the same symptoms. After this experience the use of alypin (20 to 30%) was resorted to with no bad effects.

Stenosis of the trachea and bronchi. The tracheoscope and bronchoscope have revolutionized the treatment of stenoses. Lesions, formerly impossible of diagnosis and treatment, are now open to inspection and successful surgery. The removal of small tumors is now successfully done and the dilatation of strictures is fairly frequent. In advanced and stubborn stenoses low bronchoscopy is better than the high operation because a long tracheal canula can be introduced to keep the stricture open permanently if the lesion is confined to the trachea. Under this heading a very unusual case of stenosis of the trachea and bronchi will be described in detail because of its rarity and the difficulties attending its treatment.

G. McD., 30 years old, farmer, native of South Carolina, about two years ago began to experience some difficulty in breathing. His parents, brothers and sisters are all healthy and up to the time of his present illness the patient had been perfectly well. At first the difficult breathing showed itself only on exertion, but it gradually grew worse until it was constantly present, and the slightest exercise caused dyspnea. Occasionally alarming attacks of dyspnea and cyanosis would appear without any cause. His family physicians prescribed for him, but, finding that his treatment did no good, he took him to Atlanta, where different specialists were consulted. They made a probable diagnosis of aneurysm and declined to attempt bronchoscopy for fear of rupturing the sac. No specific history could be obtained, but in Atlanta two Wassermann examinations were negative. He was given mixed treatment on general principles and sent home. He continued to grow gradually worse, and March 1, 1912, he came to Baltimore for treatment. When the writer saw him the first time, his breathing could be heard over the room. Under morphine and hyoscine and alypin locally the writer immediately passed the 7-millimeter bronchoscope. Eight inches from the upper teeth a stricture of the trachea was found with a breathing space of only 4 millimeters. It was impossible to pass the bronchoscope through the stricture, so it was withdrawn and the 5-millimeter tube introduced, which, after some coaxing, slipped through to the bifurcation. The diseased process extended to the bifurcation and the bronchial tubes, both of which were narrowed to about three-fifths of their normal size. The diseased tissue had a red granular appearance, and the writer immediately thought of a malignant growth. Above the stricture the trachea was normal. The carina was greatly thickened—at least three times its natural size, and this added to the narrowing of the bronchi. For thirty-six hours after the dilatation the patient breathed better. Then the stricture gradually closed and breathing became rapidly worse; he was told that the opening

of the trachea was the only thing that would save his life. He finally consented to the operation and a low tracheotomy was done with the patient sitting, under local anesthesia. Just as the trachea was entered, the patient cried out that he could not breathe and fell back cyanotic and apparently dead. Jackson's small tracheoscope was forced into the trachea and through the stricture; with the help of artificial respiration and stimulation the patient soon recovered and was put to bed in good condition. That night the resident physician who had charge of the case went out, and at 11:00 o'clock the patient was cyanotic and almost dead from the plugging of the tube with blood and secretions. Dr. Devilbiss was sent for and, though he had not seen the tracheotomy and knew nothing about the case, promptly pulled the tube out and resorted to artificial respiration and stimulation, thereby saving the patient's life. A long Jackson's tracheal canula was ordered, but it was found to be too short to go through the stricture. A special tube was obtained from Pilling measuring four inches in length and nine millimeters in the inside diameter. The introduction of the tubes caused severe constitutional symptoms; the temperature would fluctuate between 102° and 104° and extreme prostration would follow. For some time the stricture was dilated from day to day without trying to keep the tube in. When the trachea became more tolerant, which happened in about two weeks after the tracheotomy, the patient was allowed to sit up. Every effort was made to find the cause of the trouble; a Wassermann examination proved negative, but on general principles two doses of salvarsan were given without any effect on the breathing. The patient could now wear his tube a part of the day; it would then have to be removed and a short tube substituted to keep the tracheal wound open. Treatment was begun March 1, 1912, and on April 1, when the constitutional symptoms had quieted down permanently and the writer was ready to begin the removal of the diseased tissue, the patient insisted on returning to his home. He was told that he should remain under treatment several months at least, but, as he was determined to go, he was cautioned to keep the tracheal wound open at all hazards. He did not do so, and two weeks later he had an attack which came near ending his life. A surgeon reopened the tracheal wound and forced the canula through the stricture; for the third time artificial respiration and stimulation saved his life. He returned to Baltimore the latter part of April to remain as long as might be necessary. Systematic treatment was immediately begun to remove the diseased tissue. The 8-millimeter tracheoscope was passed through the tracheal wound and as much tissue as possible removed from the tracheal walls with Pfau's cutting forceps. The tissue was soft and friable and promptly returned. The operation was repeated from time to time with the same result. The high frequency spark was now tried, but without result. Repeated microscopic examinations showed always the same thing—chronic inflammation. The tissue returned so surely and so rapidly after these procedures that the writer felt like giving up in despair, when Dr. William Caspari suggested the use of pure chromic acid applications. The result of the treatment was magical; the acid, fused on the end of a probe, was applied directly to the diseased tissue through the bronchoscope. Wherever the acid was applied a yellowish slough would form which would be coughed up in a few days. Some apprehension was felt at first as to the effect of the acid when used so near the lungs, but beyond a slight burning sensation for some hours after the application, no bad effects were noted. The treatment was given once weekly and the improvement was marvelous. In a few weeks the tissue in the trachea had all disappeared and the walls were comparatively smooth with a diameter of about 12 millimeters. Just above the bifurcation there still remained a peculiar formation posteriorly which forced the end of the tracheoscope far forward to see the bronchi. The acid reduced this spot more slowly than the soft tissue above. By the first of August the trachea was in good condition and the patient was allowed to go to his home for a vacation. He had learned to take out the tube, clean it and put it back. During his stay at home he had an attack of malarial fever which put him to bed for two weeks. The latter part of September he set out to return to the Presbyterian Hospital. When he reached Washington, he noticed that his breathing was bad; he attributed this to the fact that he had had no opportunity to clean his tube on the train. On his arrival at the hospital he was in bad shape; Dr. Caspari in my absence removed the tube and gave him a hypodermatic injection of morphine, when he quieted down and had no more trouble. Late that afternoon the writer passed the tracheoscope and found the trachea and bronchi in about the same condition as in the summer. Chromic acid applications to the swelling just above the bifurcation were now resumed with the result that the lumen of the trachea gradually increased in size. About the middle of October, when everything seemed to be progressing nicely towards ultimate recovery, it

was noticed that the left bronchus was filling gradually with the same soft tissue that had given the trouble higher up. It was removed as well as possible with the forceps and chromic acid applied to the base. Healing was as rapid as it had been above; since then the bronchus has remained open and the patient's breathing is good. December 17 the patient took a short walk and returned to the hospital in good condition. One hour later he had a hard chill and his temperature immediately rose to 105.4°. Though nothing definite could be found in his lungs, all felt that pneumonia had developed and the patient was certainly doomed. The temperature began to fluctuate between 97° and 106°; one day the morning temperature was 96° degrees and in the afternoon rose to 106°. Dr. Gordon Wilson saw the patient, but would make no definite diagnosis; he advised large doses of urotropin. The patient continued to have his high temperature for two weeks longer, making a total of four weeks. His appetite failed and he rapidly wasted away. Finally when all were wondering at his wonderful vitality and speculating as to how long he could survive such temperatures, his temperature suddenly dropped to normal and remained there for two weeks, his appetite improved and he soon began to increase in weight. At the present time—the latter part of January, 1913—he is having temperature again varying from normal to 102°. He claims that his breathing is better than it has been for a long time. It is interesting to note that just about a year before this attack he recovered from pneumonia after a long illness. If he recovers from his present illness, an attempt will be made to substitute a short tube for a long one; if he breathes freely through this for a week, it will be removed and the wound will be allowed to close.

Syphilis of the trachea. In this country the severe specific changes are not as common as they are in Europe. In a large number of tracheal examinations, the writer has not seen syphilitic changes in the trachea. If gotten in time before contraction sets in, salvarsan is the proper treatment; its action should be as prompt in the trachea as in the larynx, where its effects are sometimes little short of marvelous. Bronchoscopy allows a prompt diagnosis in cases which formerly could not have been treated successfully.

Spasmodic asthma. Ephraim, in a recent article, claims remarkable results in the bronchoscopic treatment of asthma. In a total of 59 cases, he reports 37 cures running over variable periods, and 10 cases improved, while the remainder were not benefited. When one considers the hopelessness of the asthmatic, these results are wonderful. In this country Freudenthal has treated several cases successfully. In his paper he states that the treatment must be long continued in some cases; that when one has about given up some patients, improvement followed by cure sets in. The writer has cured one case of asthma with the application of cocaine and adrenalin in the bronchi, while in another patient no good was accomplished. The usual treatment consists of the application of cocaine and adrenalin to the mucus membrane of the bronchi. There is no reason why argyrol and nitrate of silver could not do good in those cases in which the membrane is reddened and thickened. The treatment is justifiable in all cases of pure spasmodic asthma, since it seems to be the only means of affording relief.

The diagnosis of the cause of obscure dyspnea. Through the bronchoscope one can diagnose external pressure on the respiratory tract. If the so-called "scabbard trachea" is seen high up with the anterior wall pushed back or one lateral wall pushed over towards the other, one can safely diagnose thyroid pressure, though the gland externally may appear small. Further down the "scabbard trachea" may be caused by pressure from an aneurysm which can be diagnosed with remarkable certainty by the extreme, heaving impulse at the point of constriction. One case is recorded in which an aneurysm was mistaken for a tumor of the trachea; a piece of the "growth" was removed with with biting forceps with death of the patient. In other cases a mediastinal tumor may be the cause of the constriction, and in children, especially, pressure from an enlarged thymus or a tubercular gland in the mediastinum which usually pushes the posterior wall forward. In tumors of the trachea of small size, removal through the bronchoscope should always be tried. In malignant growths low down the same measure should be resorted to to give temporary relief.

Foreign bodies in the trachei and bronchi. One of the most wonderful as well as one of the most interesting uses of tracheo-bronchoscopy is the removal of foreign bodies from the trachea and bronchi. A little more than a decade ago the majority of cases of foreign bodies in the lower air passages resulted fatally. The external opening of the thorax was nearly always fatal; in those cases in which tracheotomy was done, the foreign body, if in the trachea, was sometimes coughed out, but, if not, forceps were introduced through the tracheal wound to fish blindly for it. If the object was impacted in a bronchus, it was almost impossible of removal

by any method. In 1897, Killian removed a foreign body from a bronchus through the bronchoscope by throwing light down the tube from an electric headlight. Since then operators throughout the world have demonstrated the usefulness of the bronchoscope in this class of cases. Though many articles have appeared, it is a curious fact that many physicians and surgeons, some of them eminent, seem not to have heard of tracheo-bronchoscopy or having heard, do not take the trouble to inform themselves of its value. In this city—and the same thing doubtless happens in other cities—it occasionally happens that patients with foreign bodies in the bronchi are sent home without the removal of the object. Not so long ago, a boy was taken to a surgeon in a local hospital with the history of having a foreign body in a bronchus. A throat specialist attempted its removal through the bronchoscope, but only succeeded in pushing it two inches further down. Another specialist then tried it, but did not succeed in getting it. The patient was sent home and the father advised that the object would become encapsulated and would give no trouble in after life. In this case the foreign body, being metal, could have been removed with the method adopted by Iglauer in removing a small screw from the bronchus of a child under the most unfavorable conditions. The screw had been in the bronchus for some time, and when the bronchoscope was passed, a large pus cavity was found which prevented a view of the object. Since the removal of all the pus seemed impossible, Iglauer conceived the idea of trying to remove the screw with the giant magnet. A steel wire was passed through the bronchoscope and one end attached to the magnet. When the current was turned on a distinct click was heard as the screw leaped to the magnet. The magnet, wire and bronchoscope were then pulled away from the boy and the screw was found on the wire. In searching for foreign bodies in adults, the writer uses local anesthesia applied by means of a spray through the bronchoscope. If necessary to quiet the cough reflex, hyoscine is injected, which allows the passage of the tube with a minimum of anesthesia. In foreign bodies which are seen early, there is not much secretion in the tubes, especially if atropine is injected and there is little danger of filling up from absence of the cough reflex. In bronchoscpoy it is a safe rule never to give an anesthetic if it can be avoided. The first foreign body removed by the writer was peculiar. A girl, 12 years old, was wearing a hard rubber tracheotomy tube for stenosis of the larynx. One afternoon the resident physician took the tube out to clean it and replaced it without noticing that the canula was almost unscrewed from the plate. About an hour later as the girl was eating cake she suddenly choked and became cyanotic. The nurse was badly frightened and rushed down stairs with the information that the patient was dying. When the writer saw the girl, a few minutes later, she was quieter, but her breathing was bad. She was taken to the operating room, put to sleep, Jackson's 5-millimeter tracheoscope passed through the tracheal wound, and the tube removed from the right bronchus. The patient made an uninterrupted recovery.

In a boy, 7 years old, the bronchoscope was passed with the head straight in the removal of a grain of corn from the right bronchus. In a child, 2 years old, with a watermelon seed in the trachea, the 5-millimeter tracheoscope was passed without the separable speculum and the seed removed through it. In the methods described above the effort has been made to simplify the work so that every laryngologist can use it successfully.

It may not be amiss to refer briefly to the different methods of removing foreign bodies of various shapes and consistency. Sharp bodies such as pins, pieces of bone, etc., are better removed under general anesthesia, because of the danger of injuring the tracheal or bronchial wall with local or no anesthesia. The writer believes it is better to put older children to sleep under these conditions, while younger children as emphasized above should never be anesthetized. For straight pins any good forceps can be used to seize them. If the pin is sticking in the wall of the tube, it must first be carefully disengaged and then drawn out through the tube. Safety pins have to be carefully handled if open with the pin up. Jackson, Mosher, and McCoy have devised closers which render the pin point harmless. Jackson's instrument is very satisfactory, as is McCoy's, for small pins. A detailed description of these instruments would take up too much space. For soft objects such as bean extractors have been devised. Jackson uses an instrument which works on the same principle as the pin closer; the extractor is introduced straight, worked carefully below the bean and then by a special mechanism the end is turned to a right angle and the bean coaxed upward. Brunings has a "claw" forceps which is intended to grasp the body, but not to break it into bits as the average forceps often do. For removing buttons, special forceps are made, and Brunings has a tip to grasp a collar button a certain way. All these instruments facilitate removal of foreign bodies, and one who expects to do bronchoscopy must have at least one of each kind.

Hooks, because of their small size, are sometimes used to advantage to work below a foreign body and then to bring it up into the tube. So far the writer has succeeded in removing all foreign bodies with forceps which are always manipulated with gentleness. No greater mistake can be made than to attempt to use force in the extraction of a foreign body. As a rule they are ready to be removed and only slight traction is needed to start them upward. If a "granulation" stricture is in front of the foreign body, it must be gently dilated before any attempt is made to remove the object. Probably in no branch of medicine is a good view so essential and so difficult to get as in bronchoscopy. "Look before you leap" is the most important part of the work. After one has had a certain amount of experience, the removal of most foreign bodies is not particularly difficult. Even in children in whom the use of small tubes is necessary, the slender forceps will give a good view through the tube so that successful work is the rule. The writer is strongly opposed to tracheotomy until an attempt has been made to extract the foreign body through the larynx. Working through the 5-millimeter tube much can be accomplished, because in young children the object usually lodges in the trachea, which makes the working distance only a few inches provided a short tube such as Jackson's tracheoscope is used. In such cases the writer always uses a short, slender forceps, which is more easily manipulated than a long instrument. From what has been said above, it is evident that no hard and fast rule can be laid down for the removal of foreign bodies from the trachea and bronchi. Each case must be handled individually, the operator always bearing in mind the difficulties and complications which may arise in cases which appear the simplest. The writer can only repeat what has been said before, that, in his opinion, the best way to become an expert bronchoscopist is for one to practice in his hospital work with the smallest possible tubes so as to train the eye. In his work he uses small tubes and passes through them the largest possible instruments and then endeavors to see around the instrument, as it were. Touching certain spots in the trachea and bronchi is excellent practice. When the eye has been trained to see well through small tubes, there is no difficulty in working through the large tubes, and when it becomes necessary to examine young children, one finds that his practice has not been wasted. It is very difficult to see through Jackson's 5-millimeter tube in the beginning. But the writer is confident that if one will adopt the course advised above, he will soon be able to see as well through the small as through the large tube, the field, of course, always being smaller. Successful work through small tubes is more gratifying and satisfactory because anyone can see to work through large tubes, while to become an expert operator through the small tube means hard and earnest work. It is true that the things that we work hardest for are the most satisfactory in the end. Having worked so long through the small instruments, the writer feels that he can conscientiously disagree with Brunings when he says that tubes smaller than 7.5 millimeters are practically useless.

(To be continued.)

MILITARY SURGERY.

GUSTAVUS M. BLECH, M.D.,
CHICAGO.

(Continued from June number.)

So far we have discussed the treatment of the average gunshot wound of the abdomen from the standpoint of the frontal aid stations.

We now come to review the problem when the patient is presented at the field hospital.

Here we have facilities for abdominal surgery or any other regional surgery, provided operative therapy is imperative. The experience with laparotomy in field hospitals, however, has not been good, the mortality being simply enormous.

Why? Not because the surgeons cannot operate under aseptic precautions, for the instruments and materials can be rendered sterile and hands and skin can be disinfected there as well as in any civil institution, but simply because the patient comes too late for laparotomy.

I will put it in this simple way, to avoid the possibility of misunderstanding: If the patient shows no signs of peritonitis when reaching the field hospital, there certainly is no indication for operative therapy, and if the evidence of peritonitis is present, the time for successful intervention has passed. Laparotomy in such a condition means simply to spread the peritonitic process and cause certain death.

Having missed the proper time, there remains only the conservative treatment and to await a more favorable period, say, when the patient can be transported to the base hospital, because there the therapy will be restricted to the relief of localized peritonitic processes, such as circumscribed abscesses which have been walled off.

We see that we have to follow a teaching which

in practically every respect resembles the views held at present for acute appendicitis.

In appendicitis laparotomy promises success the first twenty-four hours (except the foudroyant forms where aid is almost always too late); that time having passed, few surgeons risk operations and wait till the stormy phenomena have subsided. After that operation is safe.

The treatment at field hospitals, therefore, will consist of rest, ice-bag to the abdomen, Fowler position, saline clysmata, etc.

Medical officers with surgical experience will realize when they see a soldier suffering from acute peritonitis that operation is out of the question, because the grave prognosis is written on the brow of the unfortunate sufferer.

But, one will say, what about these cases which do not run a stormy course, the type commonly designated as sub-acute peritonitis?

In patients "lingering" with phenomena of peritonitis, section of the abdomen has proved a most extensive adhesive peritonitis. The entire ileum seems glued together, studded with little pus pockets. While admitting that the prognosis, both as to life and after well-being is very grave, surgery can hold out no promise of relief—if anything, disaster is invited by such rash measures.

The situation is different when we have to deal with extensive wounds, such due to portions from a burst shell. Here we may see a defect large enough on retraction of the wound margins to enable us to recognize intenstine or stomach. If these are extensively torn and the patient's condition is not desperate, the viscera should be gently cleansed with sterile gauze sponges and an attempt made to close the visceral defects. Usually this will be in the form of closing the stumps by an inversion suture and performing lateral anastomosis.

A sad chapter is formed by the secondary hemorrhages. A missile that struck a vessel in the liver, spleen or hollow viscera may, while it remains lodged in the abdomen, act as a tampon. After a few days or even as late as nine or ten days, when one anticipates no fatal issue, the missile may become detached and produce thereby a fatal internal hemorrhage. In such cases, if the condition is promptly recognized and aid given, lives may be saved, but usually laparotomy will come too late, the patient dying from exsanguination in the course of a very few minutes.

The situation of the kidneys being extraperitoneal, makes the study of their gunshot injuries very interesting.

External hemorrhage of the kidney, if not apparent through the appearance of blood from the wound channel proper, will show itself through the bladder, thus making the diagnosis comparatively an easy one.

In internal hemorrhages, we have conditions resembling injury to other glandular organs of the abdomen, with the exception that the hemorrhage is either intra- or extra-peritoneal. The former will offer such diagnostic difficulties that one will seldom be able to locate the source of the hemorrhage with precision; in extra-peritoneal hemorrhages, however, unless the hemorrhage is very profuse, a diagnosis may not be made for some time, that is to say until the blood accumulated in the retroperitoneal space has become infected and produces the clinical phenomena of a localized abscess—suppurative hematoma.

The treatment does not differ from that discussed for the abdomen proper. In the field hospital, it would be a mistake, however, to do what has been "accomplished" at the last Balkan war; the packing of the wound and retroperitoneal space with long pieces of gauze. Such a step means inviting sepsis and death.

No surgeon will hesitate to expose the kidney and to arrest hemorrhage by suture, because peritonitis need not follow such operations. This has its application only in the event we have to deal with kidney injuries pure and simple. In the event of the peritoneal cavity having become involved—and this will be the case most frely—the problem becomes the same as if we had to deal with intestinal injuries only.

Injuries of the *ureter,* not complicating abdominal injuries, are so rare that they can be ignored. A thorough study of the available literature convinces me that ureteral injury has never been observed. Where a surgeon has surmised such an injury from an existing sepsis the diagnosis is not free from objection. It is not inconceivable that the ureters have the tendency to slip out of the path of a small caliber missile, as soon as the tissues above it are touched.

Gunshot wounds of the bladder, however, represent, as a class, a grave injury, especially when, as has happened again and again, the bladder has been secondarily involved. In a primary wound, i. e., when the bladder has been hit by a small caliber missile, and it was not distended with urine previous to injury, the size of the injury is of prognostic importance. Where, on the other hand, adjacent bony structures have been shattered and the bladder torn by the fragments, the result is a frightful one.

The problems that present themselves refer to the ability of the bladder to hold urine, to the extravasation of urine into adjacent tissues or into the peritoneal cavity and, finally, whether particles of bone, hair or uniform have been forced into the peritoneal cavity.

An immediate diagnosis of a comprehensive character will scarcely be possible, especially since, owing to the contractibility of the external muscles, visual methods are possible only in extensive injuries involving the abdominal wall proper.

The first thing to observe, then, is whether or not the patient can pass water per vias naturales or through a small wound opening (fistula). If this be the case, we know that the injury has not been extensive and the only thing to fear is urinary infiltration, similar to that seen in civil life, and in the absence of a fistula we may even see good recoveries.

The patient does not pass urine per urethram or through the wound channel. We introduce a catheter and obtain either a few drops of urine or blood or both or the bladder is found to be empty. We must assume in such cases that the peritoneal cavity is receiving the urine and, of course, peritonitis is sure to follow.

In the frightful conditions above referred to, when bladder and adjacent bony structures have been destroyed, the bladder injury has only secondary significance; the general injury being such as to make almost any therapy hopeless.

The therapy depends on the condition present. The patient should have his external wounds dressed aseptically at the front and sent to the field hospital with the greatest possible despatch.

Our main reliance when the patient cannot empty the bladder spontaneously is on the catheter. Syphonage of the bladder is impractical and useless. If urine appears through the catheter this can be repeated as often as necessary, provided the little procedure is performed with extreme gentleness and aseptically. If the urine is not collecting in the bladder, urethral drainage will accomplish nothing except the irritation and infection of the viscus.

In all cases of urinary infiltration the indication is to operate. In this way the infiltrated urine is allowed to leave the tissues and a peritonitis may possibly be averted thereby.

Whenever possible an attempt should be made to close the bladder defect by suture. In those sad cases where the bladder has been destroyed beyond redemption the decision will rest between liberal doses of morphine to relieve the remaining few days of the sufferer or risk excision of the ureters and their transplantation into the sigmoid.

We know from civil life that implantation of the ureters into the rectum is a risky procedure, because usually followed by an ascending pyelitis.

Personally I am in the belief that such an operation should be attempted and that a method described by Mirotworzeff in the Russian literature and later in the German periodicals is the one to be chosen. The frame of this serial is too small to allow of an extensive description of surgical procedures, with which surgeons are assumed to be familiar, so I will here state that Mirotworzeff has succeeded in successfully implanting ureters into what he terms the pelvic colon by suturing the ureters into the intestinal wall similar to the manner in which a tube is sutured in Witzel's gastrostomy.

It goes without saying that urotropin should be administered freely as well as intestinal antiseptics.

In civil practice we have a valuable preventive agent in vaccinotherapy; in the field, of course, this method cannot be made use of.

ACUTE MYALGIA OF THE ABDOMINAL MUSCLES. A CONDITION TO BE DIFFERENTIATED FROM SURGICAL LESIONS. *

JAMES T. HANAN, M.D.,
Attending Surgeon, Mountainside Hospital,
Montclair, N. J.

When a careful search of the available literature in the English, German, Italian and French journals, for the past eight years, reveals only three articles upon this condition it means one of several things; that the affection is a rare one; that it is more or less frequently present and undiagnosed; or that it is mistaken for some intra-abdominal lesion.

It would seem strange that such a thick bundle as the rectus abdominis and pyramidalis or the bulky layers of the combined external and internal oblique, with the transversalis, should not be the site of acute pain without intra-abdominal trouble while the trapezius, sterno-mastoid, deltoid, lumbar and glutcal muscles are often involved.

The fact seems to be, however, that we are prone, in the presence of abdominal pain, to at once boldly fasten the guilt upon some deeply situated organ and plunge from the exterior to the interior of the abdomen without regard to the structures interposed.

* Read before the Orange Mountain Medical Society, June 19, 1914.

One cause of this, I am sure, is the helpful or hindering leucocyte count; and it may be one or the other if too much importance is attached to it alone. Another and more potent evil is that the appendix lies, ready at hand, to shoulder the blame of a mistaken diagnosis if the condition happens to be a right-sided affair.

I am firmly convinced that myalgias of the abdominal muscles, without underlying visceral inflammations, do occur and much more frequently than is supposed; and that it is high time that the abdominal wall shouldered some of the blame for many an innocent appendix needlessly cut off.

I do not wish to underrate the perplexity often existing in a given case; but I shall try to point out a few things that may help to place the blame, in the majority of instances, where it belongs; and this is always more apt to be difficult than easy in any abdominal lesion.

The left-sided pain brings to mind the possibility of a kidney, colon or sigmoid affection; the right-sided one to an appendicitis, typhlitis or gall-bladder inflammation or perhaps a kidney cause; more centrally and above the umbilicus, duodenal and stomach ulcers are relatively frequent while below so often exist the pelvic conditions.

How shall we go about our work of attempting to differentiate? Is it possible to show a leucocytosis in cases of myalgia not involving the abdominal walls? I have seen the total count, in a severe gluteal case as high as 11980 and 12450 with a polynuclear rise of 73 1/3% and 85%, and in a shoulder and neck case, with severe pain, a rise to 10300 with the polynuclears to 78%.

This shows that there may be a moderate or even considerable leucocytosis in a myalgia of average or severe type with no viscera beneath to obscure the actual muscle condition.

The temperature and pulse may rise considerably, varying with the degree of irritation in the affected tissues and may, if the muscle pain is a very severe one, accompanying a myositis, simulate a septic remittent type.

There seems to be, at times, some coincidence with the spring and fall seasons of this condition. The history of exposure quickly followed by the onset of acute pain may often be elicited; or previous muscle pains, located elsewhere, help to put one on the right track.

A sharp tap on the belly of the muscles or, more particularly, their tendinous attachments, excites prompt pain when often gradual deep pressure offers a mild discomfort in comparison, and this is highly significant, as an abdominal lesion usually gives more pain the deeper and firmer the pressure. If the belly is distended and tense from a peritonitis, this of course does not hold true, but the condition then is not usually a doubtful one.

The patients do not look abdominally sick, if I may use this expression, although this is, of course, not to be too much relied upon, as intra-abdominal lesions often fail to give rise to any typical facies or attitude.

Patients may or may not have severe pain upon using the affected muscles and these are not likely to be tense or rigid, rather more painful and tender than stiff.

Rectus muscle pain alone may be elicited by placing both thumbs on the outer border of one muscle and the remaining fingers on the outer border of the other and then pressing them together (Adolph Schmidt).

In visceral diseases, as I have said, we do not elicit much pain if the abdominal wall alone is subjected to pressure, except with peritonitis.

A few abridged histories of the abdominal type may be of interest:

Case 1. A woman, aged 22, of negative history except for mild leucorrhea, was caught in a hard rainstorm April 25, 1914, and got her feet wet. She slept poorly and began to have abdominal pain that persisted for twenty-four hours; she then endeavored to get up, which caused the discomfort to greatly increase. Bowels regular. Appetite good. On April 27th she was first seen by an attending physician; she still had considerable pain and tenderness in lower left quadrant of the abdomen opposite the umbilicus. No rigidity. Morphine hypodermatically gave quiet and sleep. Leucocytes, 16400; polynuclears 85.4%. Vomited once. The following day, temperature 98.8°, pulse 77. Tongue clean. No rigidity; pain much less. Leucocytes 12400; polynuclears 83.5%; lymphocytes 16.5%. A day later temperature 98.5°; pulse 72; tenderness diminishing and patient hungry. Following day (5th), no tenderness and patient out of bed. (Mount.)

Case 2. A boy of 6 who on two successive years and within twenty-four hours of playing in the snow and becoming thoroughly wet, was taken with acute abdominal pain referred to the right side. The legs were drawn up and any movement of the body caused intense abdominal distress. On the following day the pain and discomfort were about the same. (The first attack lasted about ten days; the second for several hours, and the child was then able to get up and play about.) The present attack is the third. Blood count at onset of the trouble: leucocytes 16000, polynuclears 81%, lymphocytes 16%, eosinophiles 3%. On the following day: leucocytes 21,200, polynuclears 80%, lymphocytes 20% in the morning. In the afternoon of the same day: leucocytes 18200, polynuclears 80%, lymphocytes 20%. Two days later: leucocytes

12400, polynuclears 80%, lymphocytes 20%. The next day: leucocytes 10400, polynuclears 78%, lymphocytes 20%, eosinphiles 2%. On the sixth day after the onset: leucocytes 8800, polynuclears 53%, lymphocytes 45%, eosinphiles 2%. Wassermann reaction negative. Slight reaction for acetone, urine otherwise negative. Temperature from 102° (rectal) to normal in four days. Pulse 140 to normal in four days. Seven days after the onset of the abdominal distress occurred much pain and swelling in left ankle; this disappeared under treatment in two days and the patient was apparently well.

Case 3. A boy, 10 years of age, much below normal, with a protuberant and flabby abdomen and often coated tongue who had for several years been subject to frequent attacks of so-called "sick headaches."

A month after I first saw him he had a recurrence of this type with a generally tender abdomen to the lightest touch and particularly so if the muscles were rolled between the fingers. The abdominal walls were soft and deep pressure did not compare in discomfort with that induced by tapping or rolling the muscles. There was some pain in moving the body to an upright position. Leucocytes 13000, polynuclears 78%.

After a brisk cathartic the headache disappeared and the muscle pain ceased in two days. (This is a type from auto-toxemia.)

Case 4. An adult female in the forties had been ill, for about five days before I saw her, with severe pain in the left lumbar, anterior abdominal and left rectus muscles. When I saw her it was with only the greatest pain that she could raise herself to a sitting position and gentle finger percussion gave rise to acute distress. Temperature 99.2°, pulse 96, leucocytes 7200, polynuclears 67%. The pain and tenderness completely disappeared in thirty-six hours under the administration of aspirin, phenacetin and hot applications.

Case 5. A man in the thirties had an attack of influenza. On the seventh day there occurred sudden general abdominal pain to the lightest palpation, but he could raise himself in bed with little or no discomfort. No rigidity and hardly any discomfort on gradual deep palpation.

In a few days under drug treatment he was entirely free from any symptoms and left the hospital. (A type from an acute infectious disease.)

Case 6. A girl of 14. Marked abdominal pain and tenderness over the right side of the abdomen; also to a lesser degree on left side. Some nausea. Diagnosis: acute appendicitis. At the operation a normal appendix was removed. On the second day following the temperature rose suddenly to 104°. Examination of the blood showed malarial plasmodia. A quick disappearance of all muscle pain and tenderness under large doses of quinine. (A type of specific myalgia.)

By what route is the pain transmitted! Possibly the cerebro-spinal nerves carry the impulses in pathological conditions, for normally the muscles are practically insensitive. (A. Schmidt.)

Concerning the causes we again encounter difficulties.

Is the disease due to an inflammation of the white fibrous tissue of the parts involved, mild or severe in character, and acute or subacute in type, brought about by some chemical irritant or microbic toxine conveyed by the blood? (H. H. Sutton.) Or are substances in the circulating fluid precipitated by exposure to wet or cold in crystalline or amorphous form, causing stiffness and pain? (H. H. Sutton.)

At any rate, why the pain should attack the sterno-mastoid, trapezius or deltoid at one time and at a later period, in the same individual but less frequently, the lumbar or abdominal muscles, is an interesting problem and as yet far from being solved.

May it not be really a short or prolonged muscle cramp due to increased tonus of the muscle bundles, producing pressure by traction upon the numerous nerve plates situated throughout these tissues and therefore particularly liable to irritation and compression where the muscle is less flexible and yielding, namely, in the tendinious or fibrous attachments? The pain, as we know, is usually the most severe in these locations.

The so-called auto-toxemias evidently play a large part in producing the conditions in many individuals and indican, in excess, may occasionally be present.

The colon bacillus is probably the most common bacterium carried through the blood stream at these times and is possibly the cause of the more prolonged and severe attacks. We have spoken of influenza and malarial plasmodia as other causative factors.

I have purposely avoided throughout the loose designation of rheumatism, believing it to be safer to look somewhat closer for the producing causes than for remedies, although the salicylates, aspirin and phenacetin, which are also presumely blood disinfectants, in association with the salines and heat, are the most useful means of relieving the condition.

BIBLIOGRAPHY.

Schmidt, Adolph. Myalgia and spasm of the abdominal muscles which simulate diseases of the abdominal organs. *Prag. med. Wochenschr.*, 1908, xxxiii, 585.

Sutton, H. H. An extreme case of myalgia. *Medical Summary*, 1913, xxv, 102.

Keith, John R. Myalgia. *Brit. Med. Jour.*, 1908, i, 1409.

OBSERVATIONS ON LACERATED AND CONTUSED WOUNDS.

L. SEXTON, B.S., M.D.,
Tulane University, New Orleans, La.

The most common wounds calling for treatment by the surgeon and practitioner in the country and smaller towns, as well as the city, are of the lacerated and contused variety, and such a radical change in their treatment and management has taken place that it may be of interest to note the present, in contra-distinction to the past methods of caring for such wounds.

These injuries are solutions in the continuity of the soft parts, produced by a dragging force or trauma, with blunt instruments, blows or tools. Infection with bacteria usually takes place at the same time the wound is produced through dust, oil, cinders, dirt and machinery grease, which are often ground into the tissue at the time. These wounds bleed less than the incised, because the vessels are torn or twisted, and the torn and irregular edges favors the coagulation of the blood. The gaping or separation from such injuries is not so marked as in incised wounds; the tissue is often crushed and pulpified. The pain from such wounds is dull, throbbing and aching if the nerve is not divided, but if pressed upon near the crushed parts the pain is continuous until the nerve is divided or released. From the above fact, contused wounds are more painful than incised wounds, but bleed less.

Shock is largely dependent upon the place of the blow, the sensibility of the patient, and the amount of crushing injury; in avulsion and crushing of bones of both limbs, as in railroad accidents, the shock may prove fatal. Healing in very slight wounds of this kind may take place without much inflammation. The separation between the tissue is filled with small coagulum, or blood clot of fibrin, which acts as nature's sticking plaster, bringing the edges together; this fibrin forms a thin scab over the wound, under which healing takes place.

The majority of contused and lacerated wounds, however, heal by second rather than first intention. The first desideratum in all these injuries is to get rid of whatever infection has been forced into the wound at the time of the injury, at the same time arresting any hemorrhage which may be present and approximating the parts as snugly as possible. It should always be remembered that reactionary hemorrhage may take place in lacerated or contused wounds when the temporary plug that stopped the vessel is blown out by reaction, or there may be secondary hemorrhage from sloughing tissue, including the veins and arteries; hence it is important that all risks of hemorrhage from these sources be attended to at the first dressing. Hydrogen peroxide, diluted half with sterile hot water, poured freely into such wounds, with the flaps held up so that all the crevices of the wound may be filled, aids in boiling out the foreign particles of dirt and infection and at the same time acts as a good hemostatic. The use of the peroxide of hydrogen at subsequent dressing may be questioned, particularly if delicate epithelium has begun to cover the wound; all applications should be very mild at this stage of healing. After washing out the wound with sterile water, all pulpified tissue and skin that is known to be dead from lack of blood supply or comminution may as well be removed with forceps and scissors, as to be left to slough and infect the wound later.

It is proper to state here that owing to the abundant blood supply to the hands and feet that many apparently destroyed extremities have been saved by conservative surgery. The recuperative power of nature in mending these members should always be given a chance. One can amputate later if the member is destroyed, but one can never retrieve the mistake of amputating too early.

One of the means of arresting hemorrhage from these wounds is by pouring an abundant supply of hot water into the wound, which flushes out the foreign bodies driven into the wound, and constricts the bloodvessels. If these crushed wounds are over bony prominences, compression is better for arresting hemorrhage than by putting in unnecessary ligatures which increase the risk of infection. Sterile gauze pressed into the wound as a compress or held with firm pressure under digital compression, checks the average bleeding and pain within a short space of time. Where a larger artery is concerned a ligature or suture is required. Fingering in the wound, or further traumatizing the tissue, should not be allowed. Hemostatic forceps and tortion will help to control the smaller vessels better than ligatures, which might carry infection. Chemical styptics have no place in the arrest of hemorrhage in these wounds, as they destroy all chance of union by first intention by the introduction of a foreign body into the wound, so they are only mentioned to be condemned. Their use may be permitted upon malignant or sloughing wounds.

The treating of all non-operative wounds resolves itself into not only cleansing the wound, but fixing the cells and epithelium, and cleansing as well the tissue adjacent to the wound, not by washing and scrubbing with strong soaps, as formerly done, but by wiping (rather than washing the wound) with

such substances as chemical solvents for the grime or grease, and always away from the wound. The grease or oil from a machine accident can best be removed by first applying a half-alcohol-half-tincture-of-iodine directly into and around the wound, then cleansing the wound by wipping away from its edges with sterile gauze saturated with turpentine, gasoline, ether or benzine.

Infection by this method is much rarer than when the injured part is scrubbed with soap and water, in a vain effort to cleanse a hand into which an accumulation of grit and stain has been ground for months or years.

The preliminary painting of the parts with alcohol and tincture of iodine seems to destroy all the skin germs. If it is a hairy portion of the body that is injured it may be soaped and shaved away from the wound. Not only are all foreign bodies to be removed at the first dressing, but also particles of crushed bone if devoid of periosteum are likely to act as foreign bodies and should be removed, as should all other thoroughly dead tissue.

The future function of fingers has been greately benefited by suturing divided tendons, muscles and nerves together. It is best to slit up pockets of wounds, if necessary to gain entrance into crannies where foreign bodies may have been lodged; mopping out the thoroughly exposed floor of the wound with equal parts of tr. iodine and alcohol, and placing gauze drains into the deeper recesses is a safe method against infections. The suture in such wounds should be interrupted and tied loosely, so as to hold the edges of the parts together and to admit of free drainage, as this is imperative, particularly in large lacerated wounds. If the soft parts are not so pulpified as to make dead and living tissues look alike, a moist antiseptic drip from an irrigator over the injured part, which is supported by a Kelly pad, is a good procedure for twenty-four to forty-eight hours, until it can be determined what can be saved, and what is irretrievably lost. This drip in Winter should be kept warm, and mildly antiseptic. A saline solution or large moist warm dressing may be substituted for this drip over the injured part.

The redressing, if the bandages are not much soiled and no pus or pain is present, need not be repeated until the second or third day. The rule of dressing such wounds daily is a mistake, unless the are infected, sloughing or very painful. Fever is the forerunner of general infection or cellulitis which occasionally follows such wounds.

When wounds are already seriously infected before they come to the doctor, which is often the case, the treatment should be by saline drip, 1-5000 bichloride of mercury or one-half of one per cent. carbolic acid solution, until all suppuration has stopped and inflammation subsided, to be followed by dusting powder of subiodide bismuth or one-half tr. iodine and one-half alcohol, and then covered by sterile gauze.

The treatment of such wounds by pure carbolic acid, followed immediately by alcohol to neutralize the acid, has not been followed much, as it is considered too heroic.

Coaptation of the wounds is essential for their ready healing, as a wound well sewed is half healed. All sutures should be put in loose to prevent tissue necrosis after the wound swells. Many times a gaping wound can be pretty well approximated by adhesive plaster. When it becomes necessary to use sutures, they should be interrupted and of silkworm-gut, if the wound is to be kept moist all the time, to prevent absorption before the wound is healed. We have used retention sutures to good effect where they held granulating edges together.

Draining from the most dependent part of the wound is very important. Making a stab wound through the skin on the opposite side of the limb often facilitates the drainage. In these large wounds where the question of infection is not settled, we should apply primary drainage and secondary sutures, *i. e.*, sutures not tied when first put in, but left loose to be tied when the risk of infection has passed, and the drainage gauze removed. Gauze drains, rubber or perforated tubes may be used for the first forty-eight hours, to be removed at the second dressing.

Rest is next in importance to asepsis in these cases of injury, and to obtain it becomes necessary to keep the patient in bed, the arm in a sling, or a limb in splints. Immovable dressings that prevent muscular action reduce the amount of pain, and promote healing. All limbs with large lacerated wounds should be immobilized by bandages, splints or other methods.

The routine injection of 500 ccm. of anti-tetanic serum in all these lacerated wounds has become the rule in all busy surgical clinics. Whether less tetanus is due to the injections of the serum, or to better cleanliness and dressing methods, it is impossible to say. The serum has no curative property after tetanus has developed. It is supposed to be only preventive.

The above methods have been applied in the largest clinics in the Charity Hospital, New Orleans, for the past few years with the best of results and fewest infections.

Medical Bldg., 124 Baronne St.

American Journal of Surgery
PUBLISHED BY THE
SURGERY PUBLISHING CO.
J. MacDONALD, Jr., M.D., President and Treasurer
92 William St., N. Y., U. S. A.
to whom all communications intended for the Editor, original articles, books for review, exchanges, business letters and subscriptions should be addressed.
SUBSCRIPTION PRICE, ONE DOLLAR
FOREIGN, SIX SHILLINGS
Original Articles and Clinical Reports are solicited for publication with the understanding that they are contributed exclusively for this journal.
It is of advantage to submit typewritten manuscript; it avoids errors.
CHANGE OF ADDRESS. Subscribers changing their addresses should immediately notify us of their present and past locations. We cannot hold ourselves responsible for non-receipt of the Journal in such cases unless we are thus notified.
ILLUSTRATIONS. Half-tones, line etchings and other illustrations will be furnished by the publishers when photographs or drawings are supplied by the author.
☞ SPECIAL NOTICE TO SUBSCRIBERS ☜
The "American Journal of Surgery" is never sent to any subscriber except upon a definite written order. Present and prospective readers please note this.
WALTER M. BRICKNER, M.D., Editor
NEW YORK, SEPTEMBER, 1914.

WHAT WILL SURGERY LEARN FROM THE PRESENT WAR?

The European war is drawing to its field and base hospitals famous surgeons of their respective countries (thus von Eiselsberg is surgeon-in-chief of the Austrian army and Bier, of the German army), and many other medical men whose names are less widely known or known not at all. That the opportunities of the great conflict will make the reputations of some of these men is to be expected. That they will develop among them an Esmarch or a Jonathan Letterman is quite possible. But that the experiences of these battlefields will provide no important contribution to surgery itself is also at least likely.

The surgical annals of the Boer war make vastly different reading from the medical and surgical history of the Civil War, for example, with its grim records of amputations and hospital gangrene; and the camp sanitation and field hospital work of the Japanese in 1904 were, likewise, vastly better than those in our own army in the Spanish-American war only six years earlier. But to-day military hygiene is standardized and well-nigh perfect, and the behavior and treatment of wounds by modern missiles are quite well established. The character of these missiles has not been changed, as far as we know since the Turko-Italian and the two Balkan wars. It would seem, therefore, that the surgical experiences of the present great war will differ in volume, rather than in kind, from those of the other all too frequent wars of very recent years. It is perhaps in the opportunities to apply our newer methods in vascular and intrathoracic surgery that the most fruitful opportunities will develop.—W. M. B.

THE MEDICAL RESERVE CORPS OF OUR ARMY AND NAVY.

At this sad time where one after another of the great nations of the earth is being drawn into the vast conflict of arms, it is comforting to us, unfettered by entangling alliances, to feel that two broad oceans separate us from the battlegrounds of Europe and of Asia. Since we settled our own internal differences a half century ago, we have engaged in but one short war and that in a spirit of altruism. But the shadow of war has fallen upon us several times. It is but a few weeks since we were held back from the very edge of war by the calm determination and wisdom of our executive. It is but sixteen years since we were actually engaged in a war that unexpectedly brought us an Oriental possession which, in the present situation, must perforce give us some concern. Even now we have a military force along our Texas frontier and our army and navy recently took possession of a foreign city where some of our marines were killed in a miniature battle. And so this peace-loving and essentially unmilitary nation may some day again feel obliged to resort to the same genteel argument that the other highly civilized nations employ, with no diminution of frequency, in the settlement of their disputes.

We abhor the militarism of Germany, we deplore the necessities that put its burden on the people of that country; but we cannot fail to admire the detail-perfection in all the departments of that huge military organization which, by instant magic, placed it, fully equipped and active, on two frontiers! To the extent that we make preparations for possible war those preparations should be just as complete and perfect. It is, however, only the preparation of the medical arm of our military forces that concerns us in these pages. To meet the necessity for a rapid enlargement of our army medical organizations, Congress some years ago created a Medical Reserve Corps of the U. S. Army (on the active list in which all prospective officers of the Medi-

cal Corps must now serve for a year or more), and subsequently it established a similar corps for the Navy.

At first there were appointed to these reserve corps men distinguished in medicine, but many of them, physically or otherwise, unfit for active service. More recently the requirements for admission to the corps have been applied more rigorously, and of the approximately 1,400 now commissioned in the Army Medical Reserve Corps, there are very many young and active men. The obligations of the commission, except in honor, are not as binding for service as commissions in the regular corps, and not all of those in this reserve could be counted upon in time of need. Of the many others, however, who would answer a call for their services, there are only a few who, beyond their civil experience, have any training whatever for the work that would devolve upon them. To be sure, in active service many of the reserve corps would be used at hospitals in large cities, at recruiting stations and in concentration camps, but others would probably be needed at the front where field service and camp sanitation would involve altogether unfamiliar duties.

The War and Navy Departments have thus far done very little to train these reserve bodies in the work that active service would throw upon them. A small beginning has been made. however. In the veteran encampment at Gettysburg a year ago two dozen of the army medical reserve corps were on duty and had a valuable lesson in the rudiments of camp sanitation and field hospital management. An equally small group enjoyed a similar opportunity this year, as guests, in the camp of the Third Field Artillery at Tobyhanna, Pa. Here, from June 27 to July 4 they were under the tutelage of Majors H. L. Gilchrist, the chief instructor; E. E. Persons and John H. Allen.

The strict régime of military life, the lectures and actual field work from early morning until sundown, the experiences of long rides, the unspoken instruction in military etiquette, the mingling with medical men of the highest type who know how to conduct themselves with military exactness, all provided a valuable lesson. But these two small opportunities came to only a handful of the corps. If those corps are to be fitted for what their commissions may some day call them, the instructions should come oftener and to all.—W. M. B.

THE ANESTHESIA SUPPLEMENT.

The interest aroused by the JOURNAL'S announcement of a quarterly 32-page supplement devoted to anesthesia and analgesia bespeaks a warm welcome for what we are about to put forth as a needed contribution to medical journalism. There is ample evidence, too, that this interest is by no means limited to specialists in anesthesia.

The first issue of the supplement, which will appear with our next, October, issue, is to contain the following contributed articles: The Relation of Anesthesia to Acidosis, by George W. Crile, of Cleveland; Insufflation Anesthesia, by F. W. Nagle, of Montreal; A. Physiological Consideration of Surgical Shock, by Prof. F. W. Pike, of Columbia University; Local Anesthesia in Hernia Operations, by James F. Mitchell, of Washington, D. C.; The Treatment of Post-Operative Shock by Prof. Charles Lieb, of Columbia University; Prophylaxis of Post-Anesthetic Vomiting, by H. Warren Buckler, of Baltimore.

Those thus far chosen to be associated with Dr. F. H. McMechan, of Cincinnati, in editing the Anesthesia Supplement are: Prof. Yandel Henderson, of Yale University; Charles K. Teter, Cleveland; James T. Gwathmey, New York; Willis D. Gatch, Indianapolis; Wm. H. DeFord, Des Moines; E. I. McKesson, Toledo; Isabella C. Herb, Chicago; Arthur E. Hertzler, Kansas City; and, in London, England, Dudley Wilmot Buxton and John Desmond Mortimer—all of them prominent as anesthetists or as investigators of the problems associated with surgical narcosis and with shock.—W. M. B.

Surgical Suggestions

In planning the incision for umbilical herniorrhaphy it is worth a little extra effort to restore, if possible, the normal umbilical depression.

As a preliminary to operating for hypospadias divide all fibrous and skin bands that curve and shorten the penis, and allow the wounds to heal with the organ stretched.

Before operating for empyema thoracis aspiration on the table should be done always even though pus has been found by previous puncture. Nor should the chest be incised until the location of the pus is thus determined accurately on the operating table.

Surgical Sociology

Ira S. Wile, M. D., Department Editor.

Social Service and Dispensary Abuse.

The problem of dispensary abuse is constantly recurring, and various means have been suggested for its elimination. Societies interested in medical economics have repeatedly suggested plans for alleviating abuse with the basic idea of safeguarding the welfare of the medical profession. It is unfortunately true that most dispensaries, in their theoretical value, are organized for the benefit of the public rather than for the extension of clinical practice to physicians and surgery. Philanthropy, not education, has been their underlying motive. The financial saving represented by dispensary treatments has never been determined with any approach to accuracy. Such figures as those presented by Fussell, of Philadelphia, merely approximate the vast extent of dispensary care afforded in large municipalities.

At the Lakeside Hospital, in Cleveland, the social service department is being utilized for the purpose of curtailing dispensary abuse. Under the plan there in operation, patients admitted for treatment are divided into four general classes: (1) Those who are without funds and unable to pay for treatment. (2) Those without funds for the immediate complaint for which treatment is desired, but who possibly may be able to pay for future illnesses. (3) Those admitted for special examinations or for major or minor surgery. (4) Those admitted merely for special examinations or who come because of dissatisfaction with their own physicians or because they cannot afford a specialist, etc.

The entire control of admissions to dispensaries should be in the hands of the social service department. This would guarantee to an extent, not now possible, the proper regulation of admissions on the basis of social, medical, and economic necessity. The ethics of the profession are then far better conserved and there is less likelihood of dispensary abuse by physicians in and out of dispensary, as well as on the part of the patients themselves. By combining the admissions and the follow-up work under the care of a single social service department, greater unity is produced. There is some reason to believe that the actual work accomplished is of greater social benefit and there is less chance for exploitation of the dispensaries and the attendant physicians by those fully competent to employ the services of regular practitioners.

The mere fact that the State laws define the type of persons who are entitled to dispensary privileges is no guarantee that the law is being carried into effect by the dispensary authorities; nor indeed is the general public cognizant of the wording of the law. Furthermore, the strict interpretation of the law would frequently cause manifest injustice to individuals really deserving special service from dispensaries on the one hand, and on the other hand, it might operate to cause deceit and irregular methods of securing dispensary service on the part of the unscrupulous, the undeserving, the dissatisfied, and the avaricious.

Undoubtedly, there are many objections to placing all problems of admission into a social medical service. Inasmuch as the social service department is organized for the social betterment of the dispensary, it becomes a legitimate function of this department to consider this phase of dispensary administration. Such organization would probably protect the dispensary from abuse to an extent that is impossible under the present form of organization, while at the same time it would insure fairer dealing with the poor, the ignorant, the suffering and the deserving persons who seek the benefits which are possible for them only in a dispensary.

The War of Races.

Swords are again unsheathed and the boom of cannon has aroused the patriotic spirits of civilized Europe. The shell of peace on a pretext so slight as to seem almost insignificant has given way to the hell of war. The trial of our wonted civilization was at hand and the vandal spirits overcame the spiritual tendencies and commercial stability, educational progress and international friendships. Surgery, disease, invalidism, pensions, poverty, crime and desolation will follow the trail blazed by the vast armies now engaged in international conflict.

The tests of modern sanitary science were made in the Russo-Japanese War, but the wide field of comparison of the methods of nations is now open to view. The systematic study of military hygiene together with the organization of medical departments for prompt administration in field and base hospitals should evidence splendid results in the protection of the conditions affecting the soldiers.

The great distress of the war will not be the

physical injuries, the sufferings and the tortures of the battlefields, but will fall upon those non-combatants who forsooth must remain at home to guard the industrial and social honor of their country. They have keener anxieties, greater sorrows, and far more enervating experiences. It is their brothers, husbands, and fathers who are plunged into the conflict. The surgery of the battlefield pales into insignificance, save as a dramatic occupation in a great war, compared with the baneful effects of the war upon potential parenthood on which nations depend for future soldiers.

The effect of this international struggle will be felt for years to come, not merely because of the empty coffers to be refilled through sweat and taxation, but in the line of weakened citizens, impoverished families, and deterioration in racial stock. Not the greatest war in the history of the world is this, but the saddest, the most unspeakable, and the most potent for affecting the welfare of the world in the future. War itself is such a pathological growth that some greater surgery is necessary to eradicate its causative factors so that the future may make the art of surgery one for the betterment of mankind in peace and plenty. The greatest war is the peaceful competitive struggle for existence in international amity. Are we little lower than the angels or merely a little higher than the devils? Man is still at heart a barbarian, though his mind seeks to control the primitive impulses. Spiritualizing has scarcely gotten into his soul. Until the mind and soul co-ordinately control men, military surgery will remain a necessity of the nations called civilized. International peace is a rainbow—would that the nations could stumble on the pot of gold.

When performing amputation, arthrectomy, osteotomy or similar operation, it is wiser to leave the constrictor in place until the dressing is partly, or entirely, applied, than to remove it after tying the large vessels, in an effort to secure the small ones. In the former case the snugly applied dressing will safely prevent hemorrhage; in the latter case there may be an alarming loss of blood from the numerous small vessels in the very time the efforts are made to tie them all.

After major amputations an elastic constrictor should always be left at the head of the bed, so that the nurse can immediately apply it in case of secondary hemorrhage.

Book Reviews

The Practice of Surgery. By Russell Howard, M.S. (Lond.), F.R.C.S. (Eng.), Surgeon Poplar Hospital; Assistant Surgeon London Hospital; Joint Lecturer on Surgery, and Teacher of Operative Surgery, London Hospital Medical College. Large octavo; 1227 pages; 523 text illustrations and 8 colored plates. Philadelphia: J. B. Lippincott Co.; London: Edward Arnold, 1914. Price $5.50.

Unstinted praise should be given to Howard for the effort to produce a satisfactory single volume of surgery for beginners. His effort has been successful, we believe, because rare judgment and common sense have been brought to bear upon it. Evidently the author realized the hopelessness of attempting to include everything of importance in his work. He therefore sets clearly and succinctly before the reader the essential facts concerning each subject, omitting theory and detail. No attempt is made to give details of operative procedures.

Although a work chiefly meant for students, it is one from which the trained specialist may learn, especially from the broad views of subjects that the author generally assumes. To students it cannot be recommended as the only book on surgery to be in their collection, but it is most highly recommended as a central storehouse of surgical information, the details of its stock to be gleaned elsewhere.

Abdominal Surgery. Clinical Lectures for Students and Physicians. By Thorkild Rovsing, Professor of Clinical Surgery at the University of Copenhagen. Edited by Paul Monroe Pilcher, A.M., M.D., Brooklyn, N. Y. Large octavo; 477 pages; illustrated. Philadelphia and London: J. B. Lippincott Company, 1914.

The work of that brilliant and original mind, Thorkild Rovsing, is universally known, and a preparation for English-speaking surgeons of these lectures is altogether acceptable. We should, accordingly, be grateful to Pilcher for having taken up the task of editing these lectures. He states that the original ideas of the author have been preserved, sentence for sentence, in order that the work may lose none of its individuality. The translation must have been excellently done, for one does not find that peculiar clumsiness of style so often manifest in translated works.

There are some statements and opinions advanced by the author to which general exception might be made. These are so overshadowed by interesting and important facts, however, that Rovsing's lectures should be read by all interested in the surgery of the upper abdomen.

Guiding Principles in Surgical Practice. By Frederick Emil Neef, B.S., M.L., M.D., New York City. Duodecimo; 180 pages; illustrated. New York: Surgery Publishing Company, 1914.

For those to whom surgery is a daily practice this small book is not intended. But for the student about to be launched into practical medicine without adequate hospital training, and for the practitioner who has not had basic training in surgery, it is invaluable. It presents a clear, common-sense analysis of the principles that underly the preparation of the patient for operation, of the instruments, of the surgeon's hands, and of the dressings; the methods of general anesthesia; the post-operative care of the patient, etc., etc. Of the excellent chapters in the book the reviewer believes that that dealing with the healing of wounds is the best, and can be read with advantage by the advanced student as well as by the novitiate. Attractively written and artistically printed, and embellished with marginal titles in red ink, the book will make pleasant and very instructive reading to those for whom it has been recommended.

Diseases of the Rectum and Colon and Their Surgical Treatment. By JEROME M. LYNCH, M.D., Professor of Rectal and Intestinal Surgery, New York Polyclinic; Attending Surgeon, Cornell Dispensary; Fellow of the American Proctologic Society, New York Gastro-Enterological Society, etc. Octavo; 583 pages; 228 engravings and 9 colored plates. Philadelphia and New York: LEA & FEBIGER, 1914. Cloth, $5.00, net.

This work commends itself by its systematic arrangement; by the modernity of its viewpoints, sustained throughout; by the author's careful attention to minutiae in the descriptions of operations, manipulations and examinations, and by the unusually fine photographs and colored plates by which it is embellished.

There is very evident a conscientious effort by the author to produce an enduring work, in which, however, he has fallen short in several respects. His style of writing, though sufficiently clear, is colloquial and occasionally ungrammatical. He seems too inclined to agree with everybody and the reader is often left in doubt of Lynch's own opinion and of the relative merits of various explanations. There is, too, much needless repetition, and, we think, too much mention of doctors who have referred cases to the author, and of private clinics where operations have been performed.

First editions of medical text-books are apt to display faults, however, and we doubt not that a second edition of Lynch's in many respects excellent work will see the shortcomings of the first issue corrected.

A Treatise on Diseases of the Rectum and Anus. Edited by A. B. COOKE, A.M., M.D., assisted by nine collaborators. Octavo; 619 pages; 215 illustrations in the text and 21 full-page plates, 7 in colors. Philadelphia: F. A. DAVIS COMPANY, 1914. Price $5.50.

This work, in great part written by the editor, has a far wider scope than the books on the same subject that have appeared within recent years. While the essential proctologic conditions receive ample consideration, it is pleasing to note that the dictum of the editor, namely, that "the first requisite is to realize that we have to do with a patient, not merely with a rectum," has been fully appreciated by the collaborators. One chapter on rectal pathology due to extra-rectal causes, and another on the relation of rectal diseases to the general health, serve to illustrate the broad, modern viewpoint of the editor and at the same time to enhance the value of the work. The latter will, it is hoped, be further promoted in the future by a more careful survey of the broader surgical and pathological literature on the one hand, and by the elimination of a great deal of the purely didactic quotations on the other hand.

The Treatment of Neurasthenia. By DR. PAUL HARTENBERG. Translated by ERNEST PLAYFAIR, M.B., M.R.C.P. Duodecimo; 283 pages. Edinburgh, Glasgow and London: HENRY FROWDE and HODDER & STOUGHTON, 1914.

Hartenberg distinguishes "neurasthenia" from many of the conditions with which it is usually confused, such as phobias, impulses, hypochondriasis, anxiety neuroses, etc., although he admits that there are frequent complications of neurasthenia. The author correctly views neurasthenia as a state of general asthenia, psychic and physical, and among the more important exciting causes mentions overwork, chronic infections, digestive disturbances and emotions. Hartenberg realizes the important hereditary element as a predisposing factor, but it is rather disconcerting to find our old friend, "arthritic auto-intoxications," whatever this may means, seriously discussed as a predisposing cause of neurasthenia. Freud's theories play no rôle in the causation or treatment of neurosis. Hartenberg's treatment in the main consists of psychotherapy of the Dubois variety, drugs for symptomatic purposes, electricity, hydrotherapy and rest. The Weir-Mitchell treatment as a consistent therapeutic policy is not mentioned. The book has a strong personal flavor, bordering upon the egotistic. This is so prominent in many places as to be irritating. The value of the work is marred by the absence of an index.

Medical and Surgical Reports of the Episcopal Hospital in Philadelphia. Volume II. Philadelphia: WM. J. DOMAN, 1914.

This volume consists in a compilation of the various diseases treated and operated upon in the hospital, and a number of papers by its staff, based on the hospital's material. The paper by E. J. Morris, physician to the institution, is a very interesting commentary upon its growth between the year 1888 and 1912. From Frazier's paper, a review of 156 consecutive operations, one learns that there is a great diversity of surgical material at the Episcopal Hospital, and that the results of surgical treatment are excellent. Most of the papers have been published in other medical journals.

On Dreams. By PROF. DR. SIGM. FREUD. Only authorized translation by M. D. EDER. From the second German edition. With an introduction by W. LESLIE MACKENZIE, M.A., M.D., LL.D., medical member of the Local Government Board for Scotland, etc., etc. Duodecimo; 110 pages. New York: REBMAN COMPANY, 1914.

To those interested in Freud's theory of psychoneuroses, this book should prove of profound interest. It is well known that the interpretation of dreams, according to the analysis of Freud, forms the keynote to the elucidation of the cause of the psychoneurosis, so that a proper understanding of this subject is highly necessary. It is gratifying, therefore, that this essay, one of the most important and one of the most difficult to read in the original language, should be so ably translated for English readers.

Diagnostische und Therapeutische Ratschläge für den Gynäkologischen Praktiker. (*Diagnostic and Therapeutic Hints for the Gynecological Practitioner.*) By DR. ROBERT ASCH. Berlin and Vienna: URBAN & SCHWARZENBERG, 1914.

This small brochure is intended to give the practitioner doing gynecologic work practical hints as to the diagnosis and therapy of the more common ambulatory ailments.

Progress in Surgery

A Résumé of Recent Literature.

Ovarian Pain Due to Coitus Interruptus. (*Coitus Interruptus als Ursache von Ovarialgien.*) A. HERZFELD, New York. *Zentralblatt f. Gynäkologie,* May 9, 1914.

Herzfeld, on the basis of observation of several cases, has noted that when *coitus interruptus* has been practiced for some time, women begin to complain of pain during the act and subsequently feel the same kind of pain in the ovarian regions on bimanual examination. The pains radiate toward the back or toward the appendix. Properly directed treatment brings about an amelioration of the pain very promptly.

Placenta Previa and Its Treatment. PROF. W. NAGEL, Berlin. *Surgery, Gynecology and Obstetrics,* July, 1914.

Nagel considers the various methods for the treatment of placenta previa, abdominal Cæsarean section, the extraperitoneal Cæsarean operation, Dührrsen's vaginal Cæsarean method, metreurysis and vaginal tamponade. He himself favors the Braxton-Hicks method of version and reports fifty favorable cases. He performs bipolar version as early as possible when only one or two fingers can be admitted, and brings down a foot, not distinguishing between the anterior or posterior, but seizing the most accessible one. When the os is only partially dilated, the leg must not be pulled down further than to above the knee, which will be sufficient to check bleeding. Should hemorrhage subsequently occur, when the os has become more widely dilated, the foot may be drawn down slowly until plugging is again complete. The expulsion of the fetus is left to nature, and an extraction is only justified when the os is fully dilated and the child is still alive.

Nagel's figures on the fifty cases compare very favorably with those obtained by the more radical methods.

On the Pathology and Treatment of Chronic Leucorrhea. ARTHUR H. CURTIS, Chicago. *Surgery, Gynecology and Obstetrics,* July, 1914.

Curtis says that care of the general health, free elimination, and treatment of pelvic complications which predispose to mild local infection must not be overlooked in the care of chronic leucorrhea. Bacteriological examinations have shown that treatment of the endometrium can usually be dispensed with. Occasionally, dilation for drainage is indicated. Douches, curettage and tampons are probably harmful. When glands of the cervix produce excessive mucous secretion, they should be destroyed by excision or by the cautery. Purulent discharges usually originate in the lower genital tract and bacteria of low pathogenicity, mainly anaërobes, are usually the active agents.

Autogenous vaccines cause a diminution of general malaise and backache. When associated pathological conditions are corrected, their action is usually beneficial. But some patients require constant administration of the vaccines, some are permanently improved, and a fair percentage appear to be cured. Vaccine treatment, combined with dry cleansing of the vagina and local applications of iodine, seems to give the best results. The author looks hopefully toward the perfection of therapy by means of the *x*-ray, radium or specific drugs.

A Preliminary Report of an Operation for General Enteroptosis. HIRAM N. VINEBERG, New York. *American Journal of Obstetrics,* July, 1914.

Vineberg's operation is modeled after Moschcowitz's operation for prolapse of the rectum. Briefly it consists of the formation of a series of shelves of the peritoneum, beginning with the obliteration of the cul-de-sac of Douglas. With the uterus pushed down as far as possible, a fold of peritoneum is caught on either side and the two folds are sutured together by continuous suture. Three shelves are thus created one above the other until the pelvic cavity is completely closed off from above. The round ligaments are then sutured to the anterior parietal peritoneum to within one or two inches of the uterine insertion while the remainder of the ligament on each side is employed for fixation sutures to the abdominal wall according to the author's method. Vineberg reports three cases, all of which were greatly benefited by this procedure.

Roentgen Diagnosis of Uterine Tumors by the Aid of Intrauterine Collargol Injections. (*Roentgen Diagnostik der Uterus Tumoren mit Hilfe von Intrauterinen Collargolinjektionen.*) I. C. RUBIN, New York. *Zentralblatt f. Gynäkologie,* May 2, 1914.

Rubin has devised a method of injecting the uterus with collargol and of submitting the organ to the Rœntgen ray for the diagnosis of the form of the uterus and for the determination of the presence of polyps and submucous fibroids. Although he has not yet tried the method on the human uterus he believes that it is free from danger and that entrance of the collargol into the peritoneal cavity through the tubes may be avoided by a regulation of the pressure used in injecting the drug.

Retrodisplacements of the Uterus Following Confinement. AUSTIN FLINT, JR., New York. *American Journal of Obstetrics,* July, 1914.

Flint has noted that retroversion of the uterus after confinement occurs much more frequently than is generally supposed. He urges more frequent examinations during the puerperium, and when a backward displacement is found, the institution of treatment. The results of early treatment while the uterus, including its ligaments, the vagina and the pelvic floor, are still subinvoluted, are usually good, although the retroversion may be due to conditions existing before pregnancy began. The treatment consists of hot douches, the administration of ergot, and the assumption of the knee-chest posture. Tampons of glyceratannin are also useful, used every third or fourth day. After the sixth week a well fitting pessary should be inserted.

Medical Versus Surgical Treatment of Pyloric Stenosis in Infancy. L. E. HALL, New York. *Journal of the American Medical Association,* June 27, 1914.

Holt's experience includes fifty-seven cases, eighteen in private practice and the remainder in the Babies' Hospital. Pyloric stenosis in infancy presents many interesting and curious features. In the first place, it nearly always occurs in breast-fed infants and bad feeding can hardly be invoked as a cause. The predominance in the male sex is noticed by all writers. In the fifty-five cases of his own observation in which sex was noted, there were only six females. No explanation of this fact can be given. Pyloric spasm is frequently spoken of as congenital, but it is very rare for it to appear at birth or even in the first week. Only two of his cases appeared as early as the first week. In a great majority the symptoms begin abruptly, even the hour can be noted by the mother. The abrupt development of vomiting and other symptoms and their disappearance in a certain proportion of cases in a few weeks both point to spasm, but marked hypertrophy of the stomach has been invariably found at necropsies and it is to this hypertrophy that pathologists say the disease is due. According to this view the symptoms have an organic rather than a functional basis. Holt himself holds that definite, persistent spasm without hypertrophy is yet to be proved. The two elements, spasm and hypertrophy, are probably present in every case, but it is difficult to say which one is the cause of the other. The most constant and usually the first symptom is forcible and persistent vomiting. Gastric peristalsis is readily made out in most cases and a palpable tumor is usualy found. One of the most valuable means of determining the pyloric obstruction and its degree is to measure the amount of gastric retention. The child is fed a measured quantity and the stomach emptied by aspiration three hours later. Holt advises Hess' duodenal aspiration apparatus for the purpose and considers this method better than the Roentgen ray. The constipation which follows is mechanical, due to the obstruction. As regards treatment the profession is divided. Physicians hold to the utility of the medical treatment and show statistics in its favor, while surgeons take the opposite view. The crux of the whole question is, whether the symptoms and conditions are such that the patient will not live long enough for the pathologic condition to subside. The general mortality has been accepted by writers as about fifty per cent. There are medical risks and surgical risks. The former are acute inanition or slow marasmus, the chance of intercurrent disease in the enfeebled child and of sudden death without apparent cause, as sometimes occurs. There is also a question as to whether complete recovery occurs under medical treatment or whether subsequent trouble may arise. The surgical risks are those of shock, nonunion, and exhaustion, which exist in every case. Then there are the accidental risks which will be lessened by experience on the part of the operator. In private practice with the best environment Holt believes many patients will recover without operation, but in more cases operation is the least risky. The patient gets well quicker and does not have the long-drawn-out recovery. The post-operative treatment is very important and Holt emphasizes four points: hypodermocylsis, feeding, castor-oil, and posture, the head being raised in bed which is inclined at an agle of 135° or more. Breast-milk is indispensable. The medical treatment for patients not operated on consists in careful feeding and stomach washing. The patient should be carefully watched and weighed daily.

Pyloric Obstruction in Infants. A Report of Twenty-Two Personal Cases With Operation. WILLIAM A. DOWNES, New York. *Journal of the American Medical Association,* June 27, 1914.

Downes reports his experience with twenty-two cases of pyloric obstruction in infants which have come under his care. Seventeen were males and five females. Eighteen were berast-fed entirely; two partly breast-fed, and two bottl-fed. In fourteen cases the patient was the first baby; in four the second; in two the third, and in two the fourth. The symptoms appeared in from three days to seven weeks after birth and in every case vomiting was the first symp-

tom. Constipation was marked in every case; except in four or five cases the babies were emaciated and in all there were the characteristic peristaltic waves of the stomach and the pyloric tumor was present. Beginning with the eighth case aspiration was a routine measure and in each stomach from one-half to four ounces retention three hours after feeding was regularly found. The operation showed the pyloric tumor without other lesions or malformations. With regard to the operation a few points are mentioned. "Ether should be the anesthetic used. The abdominal incision should be from one-half to three-quarter inch to the left of the median line. The reasons for this are twofold: In the first place there is so little subcutaneous tissue in these babies that there is difficulty in obtaining union in the median wound, whereas the incision through the rectus muscle heals much more readily. Many post-operative deaths have followed evisceration resulting from non-union in these cases. The second reason for placing the incision to the left of the median line is the avoidance of the round ligament of the liver. At necropsy in one of our fatal cases, a large hemorrhage was found just where the needle used in closing the abdominal cavity had punctured this ligament." A partial pyloroplasty performed in some of these cases consisted in making an incision one inch long through the peritoneum and circle muscle-fiber down to the mucosa. The edges of the wound gaped widely and the mucosa protruded. N offort was made to cover or close the incision, which immediately relieved the obstruction. Gastro-enterostomy should be the operation of choice, however, where the condition of the child is even fair and the partial pyloroplasty be reserved for cases where haste is the first need. It involves a risk to the mucosa and its future is uncertain. The after-care is extremely important and much depends on the judicious use of stimulants and the proper use of fluids by hyperdermoclysis and the Murphy drip, though these are not necessary when the patient is operated on when in good condition. From Downe's experience he feels justified in offering the following conclusions: "1. Hypertrophic pyloric is congenital to the extent that there is an increase in the thickness of the circular muscle-fibers at the pylorus. The presence of this thickened muscle-fiber reduces the lumen of the pylorus, and, therefore, the stomach, in order to empty itself, contracts more forcibly than normal. This abnormal contraction soon causes the mucus membrane to become thickened and edematous, and to assume a more or less spiral arrangement as it passes through the narrowed pyloric channel of from one-half to three-quarter inch. The result is a valvular action which gradually produces complete closure of the pylorus. The question as to whether or not the pylorus will admit a probe or catheter at operation or necropsy is of little consequence when weighed against the clinical evidence of complete obstruction. 2. There can be no doubt that there is sufficient time between the onset of symptoms and the appearance of the signs of complete obstruction, for careful observation and the carrying out of any medical measures likely to prove of benefit, provided, of course, that the early symptoms have been properly interpreted. The fear, however, that the condition may have existed longer than has been suspected, and that the vitality of the baby is not so good as appearances would lead us to believe, makes me feel that operation is indicated in every case of hypertrophic stenosis as soon as the diagnosis is made. Should depression or early evidence of shock be present, immediate operation is demanded. 3. The babies coming to operation in good condition suffer little or no shock; their convalescence is straightforward, and they are at once restored to normal health. My experience in this respect corresponds with that of other operators."

Induced Pneumothorax. E. A. ADELUNG, *Oakland, Cal. Journal of the American Medical Association,* June 20, 1914.

Adelung reviews the history of artificial pneumothorax, described by Forlanini and Murphy, and describes the apparatus and technic. The manometer is the guide to the work. He gives his own experience. The benefits of the operation are not always apparent at first, and symptoms may become temporarily aggravated; but after a few weeks the good results appear, as physiologic rest has been obtained. Pain from the operation is sometimes unavoidable on account of the tension of lesions and the displacement of organs, but it is rarely of long duration and it is best minimized by gradual increase of pressure. Subcutaneous emphysema results from too much positive pressure. The spring pad hernia truss is often useful in alleviating it. Bleeding from the opposite lung is rare. Puncture of the lung is to be avoided, though it commonly causes little or no trouble. The most important accidents are pleural reflex and gas embolism, but only few deaths have been recorded. The distinction between the two is not clear, and some authors consider them to be identical. Clinically pleural reflex and gas embolism yield the same syndrome; fainting, pallor, convulsions, perhaps temporary or permanent paralysis and occasionally death. The Bauer incision seems to be, to some extent, a safeguard, and Saugman and some others aspirate before turning on the gas to see whether or not the needle is in a blood-vessel. Von Adelung says: "My conviction is that air embolism and real pleural reflex, such as results experimentally from the injection of irritating fluids into the sac, are both to be avoided by using warm, moist nitrogen, careful local anesthesia of the pleura and proper observation of the manometer. Not until the latter records free oscillations with persistent negative mean pressure can one feel sure that gas may be introduced safely, unless one is using the open method." There is much difference as regards cases appropriate for induced pneumothorax. Hemoptysis is controlled by the method and high temperature is not a contraindication. Natural pleural effusion acts the same way, but a small one may be aided by adding gas, thus inducing more complete lung rest. All writers agree that laryngeal tuberculosis is not a bar to the treatment. Pleuritic adhesions, if extensive, are a serious mechanical hindrance to the method. If slight, they may be broken down by gas pressure, if carefully applied, and perhaps sufficient free pleura may permit its use. If the patient is already dyspneic, unless it be due to a toxin, pneumothorax is irrational. Miliary tuberculosis is regarded as a contraindication, and so are serious cardiac disorders and marked splanchnoptosis. The main discussion is on how early artificial pneumothorax should be performed. Most writers advise it only in moderately advanced unilateral cases, but von Adelung thinks that careful study of the individual case should be advised. He follows Murphy in advising it in cases in which there is no absolute contraindication, and says that when it does not cure it often alleviates. He says: "My experience is limited to forty-two cases, all but one bilateral and well advanced. All but one were ambulant, the patients coming to the office for treatments. Of the forty-two cases it is noteworthy that pleuritic adhesions prohibited pneumothorax in only five. The total number of punctures done was over 614, and no gas embolism occurred; but pleuritic effusion supervened in six cases, one being purulent. Twenty-two patients gained weight and eleven lost weight, this observation being unrecorded in four cases. In thirty-seven cases in which a pneumothorax, even though small, was possible, twenty-eight patients were improved in varying degrees, one case was arrested (perhaps cured), and ten remained unimproved."

Compound Fractures. W. L. ESTES, Bethlehem. *Journal of the American Medical Association,* June 13, 1914.

Estes bases his remarks on the subject of compound fractures of the extremities on the following postulates: "1. In civil practice a compound fracture is always not only a solution of the continuity of a bone, but also a lacerated wound of the soft tissues in continuity from the periosteum to, and including the skin. 2. Violence necessary to produce a compound fracture of the bones of an extremity must be very great; hence the traumatism is extensive. Commonly the bone is comminuted and the laceration of the soft tissues very severe. 3. Compound fractures are practically always infected wounds. 4. The management of these injuries must include the treatment of a fractured bone and the treatment of a more or less extensive infected lacerated wound of the soft tissues of the same area." The general condition of the patient as well as the injury must be considered and the treatment should be adapted to the circumstances of each case. Stimulants, exclusive of alcohol, and analgesics are needed as well as

the control of hemorrhage. Estes advises the avoidance of tourniquets if possible. Elastic constriction is better and if tourniquets are used it should be at some distance from the injury. The wound must be protected aseptically and great care used to prevent infection by handling, etc. No attempt should be made to set the bone at this time. Careful fixation in the position assumed by the injured limb should be employed, unless it is clear that the ends of the fragments are so placed as to do damage. The first consideration of the surgeon should be what is best for the patient, taking into account what is best for his individuality, circumstances, and occupation, and what treatment will insure the least disability and give the best functional result; the constitution and environment have very important bearings. A compound fracture is almost always an infected wound, and Estes emphasizes the value of iodin for disinfecting soiled skin. Iodin is effective only when on a dry skin and hence it should be cleansed with benzin or ether and carefully dried. The nature of the required operation is first to be considered. Amputation is indicated if there is three-quarters of the periphery over the fracture damaged so that it is liable to slough and the muscular tissues below are badly lacerated or comminuted. If there has been a circular or annular pressure on the whole periphery of the limb, or if the bones are comminuted or loose or have lost their periosteum so that practically three inches of the shaft is destroyed together with skin or muscle laceration, this also indicates amputation. The final condition of the limb is also important. Sometimes a limb can be saved which would be useless and often in the way, and the patient might prefer amputation. Conservation is sometimes more hazardous than sacrificing a part. If conservation is decided on, however, thorough cleansing and disinfection must be done, and an extension apparatus is often very useful for this purpose. As little direct manual manipulation as possible is advised. Direct fixation of the fragments is always best, and a rigid bone splint or plate is better than wiring. Certain metals are more or less bactericidal, and since 1886 Estes has used a Wessel silver plate and Wessel silver pegs to fasten the plate to the fragments. Vascular implantations and anastomoses are impracticable in these cases, but drainage is all important and it should be done in such a way as to avoid all tension and harmful pressure in the wound. When all these things are provided for a masse dressing of dry sterile absorbent material should be applied and should be left on for several weeks, and over all a gypsum splint with flexible strips worked into it should be placed so as to give support and elasticity to the dressing. When the dressings are removed it is his custom to remove the pegs and the plate if the wound is open to permit it; otherwise it can be left as it does not cause irritation. An analysis is given of fifty-one cases of compound fractures, and the results as regards disability, etc., are reported.

The Value of Hexamethylenamin as an Internal Antiseptic in Other Fluids of the Body Than Urine. F. HINMAN, Baltimore. *Archives of Instructive Medicine,* June 15, 1914.

Hexamethylenamin is not converted into formaldehyde in any of the normal alkaline fluids of the body; therefore it can be of no prophylactic value in any of these fluids. After some infections of these fluids there may be under certain conditions a change in reaction sufficient to produce a slight liberation of formaldehyde, but it is not possible to show that there would be enough to give antisepsis. In localized infections of pronounced acidity, hexamethylenamin is not taken into them from the circulation in amounts to furnish formaldehyde in antiseptic strength (the gall bladder, possibly, excepted). The therapeutic use of hexamethylenamin as an internal antiseptic is justified experimentally for urinary conditions alone, and then only when it is excreted into an acid urine.

Hexamethylenamin. H. MCGUIGAN and C. L. V. HESS, Chicago. *Archives of Internal Medicine,* June 15, 1914.

Since, after the administration of hexamethylenamin, free formaldehyde appears only in the gastric juice and acid urine, and not in other secretions or in the blood, even with dialyzing tests, the liberation results from the acid reaction only and not from cell action. Even if it were liberated in other locations it would probably exert no beneficial action because of its reconversion or rapid acidation into injurious products. Combined formaldehyde as hexamethylenamin does not decompose readily until an acid medium is reached, when the action is that of weak formaldehyde. The only apparent indication for the internal administration of the drug, therefore, is in infections of the urinary tract.

Cause and Prevention of Pyorrhea Alveolaris and Furunculosis. F. TWEDDELL, Summit. *Medical Record,* July 4, 1914.

Following the recommendation of Reynolds in England, Tweddell reports his results in the above named conditions following the administration internally of dilute sulphuric acid. He reports "cures" of pyorrhea alveolaris and cases of furunculosis in which recurrences were prevented by this drug. It is given in thirty drop doses, which may be increased to fifty if necessary. Improvement is rapid and it is seldom necessary to continue treatment for more than eight or ten days.

Pruritus Ani JEROME T. LYNCH, New York. *Medical Record,* June 13, 1914.

For this usually intractable condition, Lynch recommends an operation based upon the procedure of Ball and Krause. In his own words, the description of the operation is the following: A point is chosen about oe and a quarter inches from the anus. At this point a one per cent. solution of novocain or a one-fifth of one per cent. solution of cocaine is injected. An area extending to the posterior midline is anesthetized. At the point above mentioned a small curved incision is made, about one-half inch long, and extending just through the skin. Through this incision a blunt-pointed dissecting scissors, curved on the flat, is introduced, as shown in the illustration. With this instrument a blunt subcutaneous dissection is now carried out, working to the anus mesially, and to the raphé anteriorly and posteriorly. When completed there is an area of skin, extending from the anterior raphé to the posterior commissure and involving all the skin within a radius of one and a half inches from the anus, which has been deprived of its sensory nerves. Any bleeding may be controlled by pressure. When the bleeding has stopped a small piece of rubber tissue is introduced into the incision and permitted to remain twelve to twenty-four hours. Sometimes, in addition, a horsehair stitch is taken through the incision; but this is not usually necessary. As a rule, at the end of forty-eight hours the wound is entirely healed. Either at the same sitting or at some subsequent time the same procedure is carried out upon the other side. Lynch has operated thirty cases by this method and is well satisfied with the results.

On the Possibility of Making a Collateral Excretion Channel by Interglandular Anastomosis Between the Parotid and Submaxillary Glands. (*Ueber die Möglichkeit, der Parotis durch interglanuläre Anastomose der Parotis, und Submaxillardrüse einer Kollateralen Exkretionsweg zu Schaffen.*) G. FERRARINI, Pisa. *Zentralblatt für Chirurgie,* June 13, 1914.

The difficulty of healing parotid fistulae is well know, and is due to the fact that thus far there has been found no way to divert the parotid secretion into another channel. The author conceived that this might be possible by anastomosing the parotid gland to the submaxillary. This was done in a number of dogs and found to be successful, both functionally and histologically. Ferranini suggests therefore the employment of this procedure in human beings.

Painless Tumors of the Spinal Cord. PEARCE BAILEY, New York. *Journal of the American Medical Association,* July 4, 1914.

Bailey calls attention to the fact that many cases of spinal cord tumor may pass unrecognized because of the absence of the symptoms of pain. That pain may be en-

tirely absent while the other symptoms are typical of spinal cord tumor is, he says, no longer open to question, and he reports a case which on account of its painlessness had long been regarded as one of Pott's disease. It was one of intramedullary sarcoma of the lower cervical and upper dorsal cord, of three years' duration. Laminectomy was performed, but the tumor could not be removed. The surgical recovery was perfect. Another case illustrating the fact that spinal cord tumors may escape diagnosis on account of the long intervals in which the pain symptoms are absent, is also reported. The lesion was in the cervical cord and had existed for eight or nine years, the motor symptoms gradually progressing, but the pain symptoms intermittent. Death followed opeartion. A third case of extramedullary psammosarcoma of the upper dorsal cord, with no characteristic pains and with surgical recovery after the removal of the tumor, and still another one of intramedullary perithelioma of the dorsal cord, likewise without the characteristic pain, are also reported, and still others are mentioned. Bailey calls attention to the importance of early laminectomy in such spinal cases without waiting for the appearance of the characteristic pain referred to the site of the lesion. If this is neglected too long, as it was in some of the cases reported, the opportunity of giving relief may be lost. Out of twenty-four laminectomies performed in the Neurological Institute during the year ending November 30, 1913, there was only one death from the operation. In this it was performed for a suspected tumor of the cervical cord, a very risky location. In view of this slight mortality he feels less hestation in recommending a more general resort to the operation.

Malignant Tumors of Bone. A new method in conservative operative treatment. PROF. R. WENGLOWSKI, Moscow. *Lancet*, May 16, 1914.

The present "coservative method of treating malignant tumors of the bones is by resection in continuity and replacement by pieces of living or dead bone. Wenglowski modifies this principle by merely removing the tumor in the soft parts and killing the affected piece of bone by the aid of steam. This is done by attaching a perforated metal tube to an autoclave or an ordinary steam kettle and applying the steam directly to the bone for varying times. The author has found by experiment that to heat the tibia to a temperature of 75° to 80° C. long enough to kill all cellular elements, three minutes are sufficient; for the lower mandible, one and one-half minutes; the femur, eight minutes, etc. To protect the surrounding soft tissues, the author covers them with gauze, a metal plate, and asbestos. To heat the posterior aspect of the bone, the author has devised a special curved flat tube. The advantage of this method over that in use at present is that the continuity of the bone is preserved.

Pseudarthrosis Produced by Interposing Sheet Silk and Bayberry Wax. R. O. MEISENBACH, Buffalo. *The American Journal of Orthopedic Surgery*, 1914, No. 2.

Although a preliminary report based on few cases, the article should be reviewed because it suggests a possible solution of the treatment of ankylosed joints. Fine China silk, impregnated with bayberry wax (after its preparation by the Lange method for silk tendons) is interposed between the joint surfaces after the necessary operation for their separation has been practiced. The silk is merely employed as a support for the wax. Bleeding from the bone is controlled by the same wax. The object of the author's technic is the interposition of a permanent, non-irritating, fatty material. Of the four cases reported, the results are good in two, and the other two are still under observation.

Paravertebral Conduction Anesthesia. *Die Paravertebrale Leitungsanaesthesie.*) P. W. SIEGEL, Freiburg. *Deutsche Medizinische Wochenschrift*, July 9, 1914.

Sellheim and subsequently Laewen, Finsterer and Kappis demonstrated the practical possibilities of inducing anesthesia for abdominal and pelvic operations by injection of the anesthetic fluid into the sensory nerves at their exits from the intervertebral foramina. Siegel now reports 170 gynecological and obstetric operations in which paravertebral anesthesia was practiced, and describes the technic of administration, the indications and sequelæ. In 70 per cent of his cases the anesthesia was sufficient; in the remainder a minimal amount of inhalation anesthesia was necessary. Any post-operative effects that were encountered could be attributed to the operation itself. The author advocates a widespread trial of the method.

Local Anesthesia for Prostatectomy. (*L'Anesthesie Locale de la Prostatectomie.*) F. LEGUEN, Paris. *Journal d'Urologie Médicale et Chirurgicale*, June 15, 1914.

The author does not approve of the two-stage operation of prostatectomy, the first stage under local, the second under general anesthesia. He has had uniformly successful results in the last sixty prostatectomies by using the following technic: Novocaine-adrenalin is employed. After the abdominal wall has been anesthetized and incised in the usual manner the bladder wall is thoroughly infiltrated. The bladder itself has been previously filled with a dilution of the anesthetizing fluid. The bladder is opened and two fingers are carefully introduced to the prostate. With these as guides the line of cleavage about the prostate is thoroughly saturated by the anesthetic. The latter is introduced through long, specially prepared needles; the fluid should run readily into the periprostatic zone, otherwise the needle has been introduced into the prostatic tumor. The urethra is infiltrated where it is to be torn through.

Prostatectomy can then be painlessly performed and complications from the anesthetic have not, as yet, been encountered.

The Effects of Heliotherapy Upon Tuberculous Fistulae. (*Die Einwirkung der Sonnenstrahlen auf Tuberkuloese Fisteln.*) E. KIRSH, Berlin, and H. GRAETZ, Leysin, Switzerland. *Archiv fuer Klinische Chirurgie*, Vol. 104, Part II.

Rollier's assistant has joined the assistant of Bier in Berlin in a careful study of a small group of tuberculous fistulæ treated by the sun's rays. The results were as remarkably good as those reported by Rollier. Fistulæ from tuberculosis of the soft parts heal very rapidly (four to six months), and the underlying foci of disease also heal in that time. Tuberculosis of bones and joints presenting fistulæ take about one year to heal. All the cases showed complete healing except when the *x*-ray demonstrated an active tuberculous focus.

The process of healing and its early stages are described by the authors. The object of reviewing the article in these columns, however, is to call general attention to the epoch-making work of Rollier in the field of surgical tuberculosis.

Chronic Intestinal Stasis—"Autointoxication" and Subinfection. J. G. ADAMI, Montreal. *The Proctologist*, June, 1914.

It is clearly shown by Adami that so little is known of the nature of intestinal absorption of toxic material that the term "autointoxication" should be dropped by "any self-respecting member of our profession." He suggests the term "subinfection," for it has been demonstrated that the mesenteric lymph-nodes take up the bacteria, pathogenic and otherwise; that the bacteria are destroyed in the lymph-nodes or in the viscera drained by the lymph-nodes, and that suppurative foci do not develop, but that symptoms appear from the liberation of the toxins of the bacteria. Adami does not deny that the indol group plays a part in the picture of intestinal stasis. He makes most vigorous argument, however, against acceptance of the theories advanced by Lane in favor of side-tracking or removing the colon for one or all of many manifestations that may have no bearing upon intestinal stasis. By discovering the cause of the symptoms a more appropriate method of treatment will be instituted.